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KODIAK MANAGEMENT AREA

ANNUAL HERRING MANAGEMENT REPORT, 1991

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INTRODUCTION

Area Description

The Kodiak Management Area comprises the entire Kodiak archipelago and that portion of the Alaska Peninsula which drains into Shelikof Strait between Cape Douglas and Kilokak Rocks at Imuya Bay. The archipelago is approximately 200 miles long, extending from Shuyak Island south to the Trinity Islands. The Alaska Peninsula portion is about 300 miles long and is separated from the archipelago by the Shelikof Strait which averages 45 miles in width, (Figure 1).

Historical Perspective

The Kodiak Pacific herring (*Clupea harangus*) sac roe fishery began in 1964 and has averaged a harvest of 1,425 tons over this 28 year period, (Table 1 and Figure 2). Prior to 1974, the fishery was unregulated with regard to harvest quotas, gear types, seasons, and fishing periods. From 1964-1977, purse seine gear was used exclusively, with an average annual harvest of 898 tons and up to ten seiners participating in the fishery. Between 1974-1978 season dates ranged from 1 March through 30 June with a harvest quota of 3,400 tons. Annual harvests, along with effort levels, fish abundance, prices and processor interest, fluctuated greatly from 1964 through 1977. Improved market conditions in 1978 prompted increased effort in this fishery with 29 purse seiners and 11 gillnetters participating. It was during this time period that a few seiners started to use airplanes to spot herring and tenders to transport herring to processors.

Between 1977 and 1982 regulatory and management strategy went through a developmental phase. Regulatory changes focused on gear efficiency, gear conflicts between seiners and gillnetters, gear

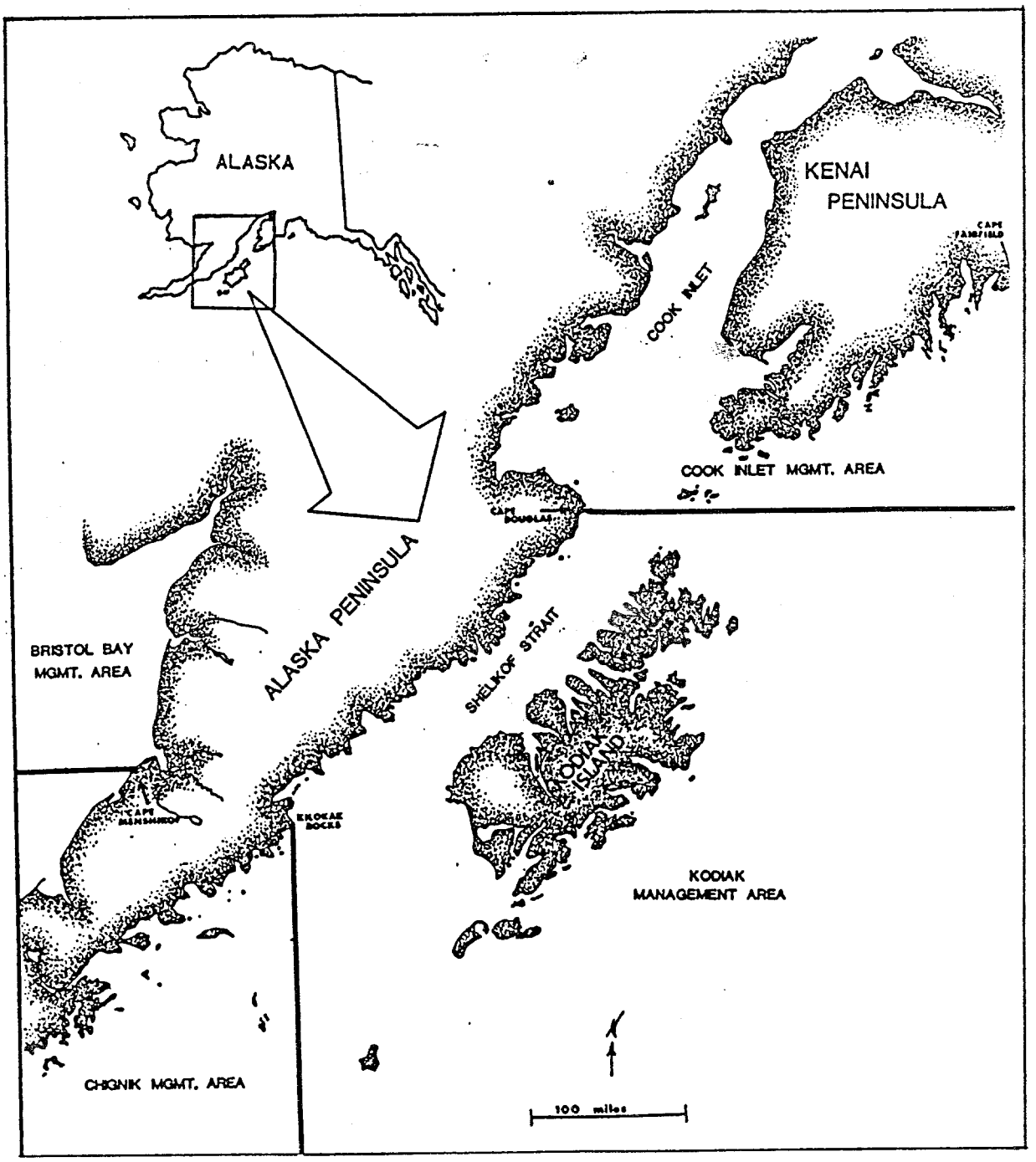

Figure 1. Map of Southwestern Alaska emphasizing the Kodiak Management Area and its relationship to surrounding management units.

Table 1. Historical harvest and effort level for the herring sac roe fishery for the Kodiak Management Area, 1964-1991.

YEAR	TONS HARVESTED	SEINE	GILLNET	NUMBER of CO'S	NUMBER OF VESSELS TRAWLS	GILLNET	SEINE	TOTAL
1964	567.8	567.8	-	2	0	0	5	5
1965	657.2	657.2	-	2	0	0	8	8
1966	2,769.3	2,769.3	-	4	0	0	11	11
1967	1,662.4	1,662.4	-	4	0	0	5	5
1968	2,000.6	2,000.6	-	4	0	0	10	10
1969	1,130.0	1,130.0	-	9	0	0	21	21
1970	341.6	341.6	-	5	0	0	13	13
1971	284.3	284.3	-	2	0	0	4	4
1972	215.0	215.0	-	1	0	0	4	4
1973	831.0	831.0	-	4	0	0	11	11
1974	868.0	868.0	-	4	0	0	26	26
1975	8.0	8.0	-	3	0	0	2	2
1976	4.6	4.6	-	1	0	0	1	1
1977	338.4	338.4	-	3	0	0	11	11
1978	903.6	880.6	23.0	7	2	7	28	35
1979	1,735.1	1,457.2	277.9	8	0	125	57	182
1980	2,383.0	2,009.0	374.0	9	1	109	92	201
1981	2,065.4	1,596.2	469.2	9	0	114	79	193
1982	1,770.6	1,447.0	323.6	6	0	67	45	112
1983	2,318.5	1,796.9	521.6	7	0	64	41	105
1984	2,162.7	1,691.2	471.5	7	0	69	39	108
1985	1,967.7	1,244.2	723.5	7	0	81	34	115
1986	1,558.4	1,110.8	447.6	8	0	71	31	102
1987	2,145.9	1,591.3	554.6	8	0	62	29	91
1988	2,171.0	1,303.5	867.5	6	0	76	33	109
1989	2,249.0	1,513.0	736.0	6	0	83	37	120
1990	2,347.0	1,644.0	703.0	6	0	63	27	90
1991	2,432.0	1,697.0	735.0	6	0	64	32	96
TOTALS	39,888.0	32,660.0	721.4					
AVERAGE	1,425.0	1,166.0	258.0					

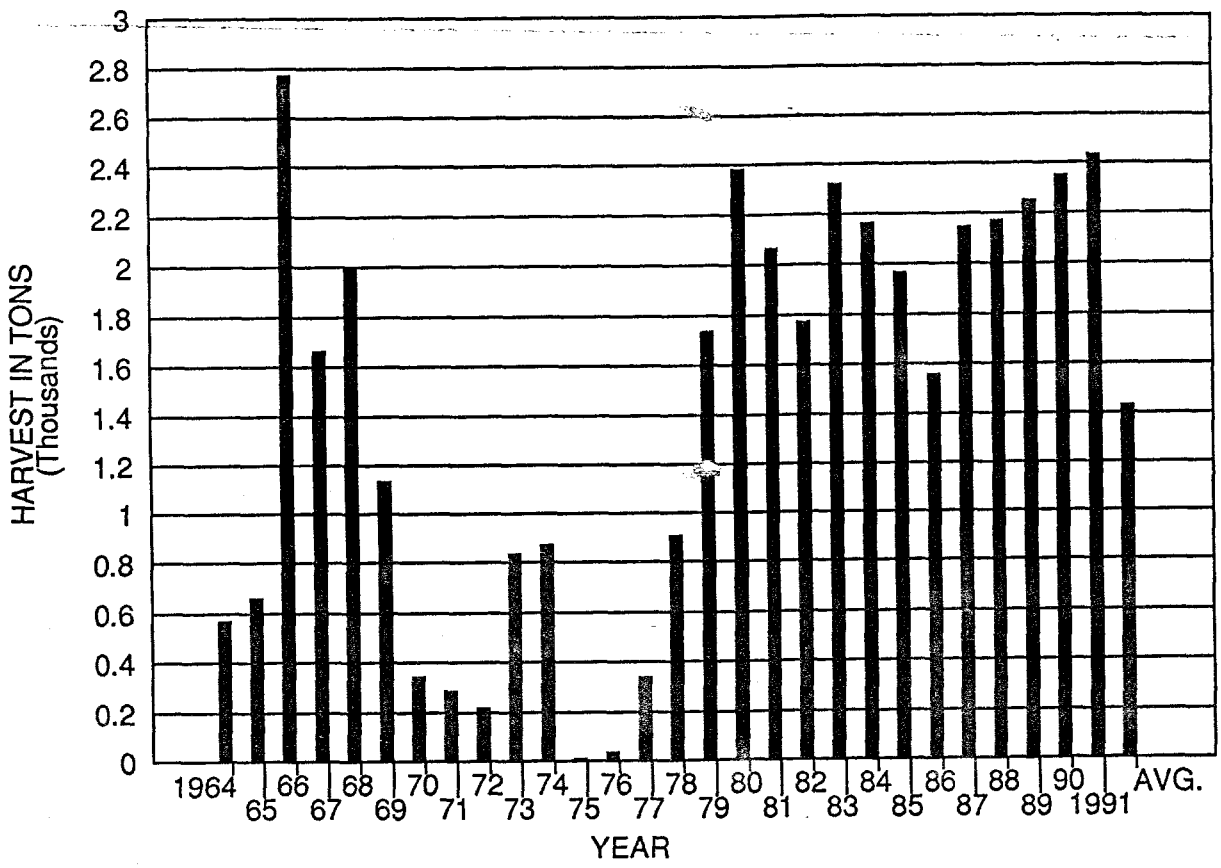

Figure 2. Historical harvests of sac roe herring for the Kodiak Management Area, 1964-1991. (Harvests between 1964 and 1974 includes food|bait and sac roe herring harvests combined.)

level restrictions (exclusive registration and limited entry) and closed waters.

In 1979 the sac roe season was reduced to 1 May through 30 June, and the overall Guideline Harvest Level (GHL) was reduced to 2,400 tons distributed throughout the management area. A limit of 300 fathoms was also placed on the maximum length of gillnets.

Gillnets were reduced again in 1980 to 150 fathoms and seines to 100 fathoms. Trawl and beach seine gear were eliminated as legal gear during the sac roe season in 1981. Fishing periods were established by emergency order in 1981 in which 24 hour fishing periods were followed by 24 hour closures.

In 1982, the starting date for the season was changed from 1 May, to 15 April. The fixed overall GHL was replaced by the current harvest strategy where GHL's are set annually on a stock by stock basis.

The overall regulatory effect during the developmental phase (1977-1982) has been the emergence of a relatively stable commercial sac roe fishery.

Fishery Characteristics

The current Kodiak herring sac roe fishery occurs from mid-April to late June in 40-50 bays and coastal locations. The fishery opens on 15 April, with the entire management area opened at one time, excluding those stocks requiring biological protection. A unique characteristic of this fishery is that it commences prior to any major build-up of herring. This allows for a more general distribution of effort and reduces harvest rates within a bay. Both gear types fish the same areas during the same time periods and roam independently in the Kodiak Area in search of sac roe quality herring. Roe recovery and quality standards are determined by industry personnel.

Beginning in 1979 combined gear levels showed a notable increase, reaching highs of 201 units (92 seiners and 109 gillnets) and 193 units (79 seiners and 114 gillnets) in 1980 and 1981 respectively (Table 1). With the implementation of limited entry following the 1981 sac roe season, new entry into the fishery was restricted to past participants until permanent transferable permits could be awarded. Since 1982 gear levels have been relatively constant with 90 to 120 units of gear fished annually. Transferrable permits for both gear types are still increasing as the Limited Entry Commission continues its determinations on participants who may qualify for a transferable permit. Only 52-69% of the 174 available permits have been used annually since limited entry has been in place, (Table 2).

The trend in overall harvest during the past 13 years has been relatively stable, averaging 2,101 tons per year, (Table 3). Prior to 1978 the entire sac roe harvest was taken by seine gear. The percentage of the total harvest by seine gear has ranged from a high of 84% to a low of 60% and has averaged 74% from 1979-1991. In 1978 seven units of gillnet gear accounted for 3% of the total harvest. Gillnet percentage of total harvest peaked in 1988 at 40%, and has averaged 26% from 1979-1991.

Most purse seiners form combines of two to ten vessels which work together with a tender and spotter to reduce operational costs and to cover more areas. The use of small, single engine, float equipped airplanes began in this area in 1979. Airplanes are the most productive way to find and direct seiners to harvestable herring. In 1986, several seiners started using side scanning sonars to locate schools of herring. This technology enabled fishermen to work during any time of the day and in adverse weather conditions which were unworkable for airplanes. Sonar technology continues to improve and most seiners are now equipped with scanning sonar, but the overall success in this area has been minimal.

Table 2. Status of Kodiak herring sac roe limited entry permits, 1987-1991.

Gear Type	Year				
	1987	1988	1989	1990	1991
G.N. TRANSFERABLE	59	63	64	72	74
G.N. NON-TRANSFERABLE	48	41	41	31	28
G.N. TOTAL	107	104	105	103	102
G.N. FISHED	62	76	83	63	64
SEINE TRANSFERABLE	40	45	45	46	48
SEINE NON-TRANSFERABLE	26	24	24	35	22
SEINE TOTAL	66	69	69	71	70
SEINE FISHED	29	33	37	27	32
TOTALS					
TRANSFERABLE	99	108	109	118	122
NON-TRANSFERABLE	74	65	65	56	50
TOTAL	173	173	174	174	172
FISHED	91	109	120	90	96

Note: Data from February 1992.

Table 3. Kodiak herring sac roe fishery summary by year and by gear, 1979-1991.

YEAR	SEASON LENGTH (DAYS)	GUIDELINE HARVEST LEVEL (TONS)	TOTAL HARVEST (TONS)	HARVEST BY GEAR TYPE (TONS)		PERCENT HARVEST BY GEAR TYPE (TONS)		NUMBER OF LANDINGS		NO. UNITS		AVG. $'S EARNED	
				SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N
1979	36	2,400	1,735	1,457	278	84	16	-	-	57	125	38,347	3,333
1980	35	2,400	2,383	2,009	374	84	16	-	-	92	109	14,978	2,573
1981	48	2,400	2,065	1,596	469	77	23	207	406	79	114	14,402	3,471
1982	59	2,400	1,771	1,447	324	82	18	138	191	45	67	17,819	2,719
1983	51	2,400	2,319	1,797	522	78	22	164	284	41	64	35,061	6,520
1984	54	2,400	2,163	1,691	472	78	22	138	212	39	69	34,691	5,467
1985	59	2,000	1,968	1,244	724	63	37	118	348	34	81	32,935	8,039
1986	61	1,690	1,558	1,110	448	71	29	132	385	31	71	34,010	6,002
1987	61	1,640	2,146	1,591	554	74	26	122	411	29	62	54,872	8,945
1988	59	2,065	2,171	1,304	867	60	40	169	555	33	76	51,350	14,837
1989	76	2,415	2,249	1,513	736	67	33	171	627	37	83	34,749	7,537
1990	75	2,375	2,347	1,644	703	70	30	156	544	27	63	51,724	9,652
1991	83	2,510	2,432	1,697	735	70	30	169	587	32	64	45,077	9,762
13 YEAR AVG.	58	2,238	2,101	1,546	554	74	26	153	414	44	81	35,386	6,835

Gillnet vessels generally work independently and usually rely on processors to provide tenders to deliver their fish to the processing location. A few gillnetters are equipped with scanning sonars but the majority of these fishermen rely on color down-sounding sonars to locate herring schools or fish areas where seiners are making sets.

Since 1979, seiners have gradually increased seine depths to the legal limit of 1,025 meshes, which includes 25 meshes of chaffing gear. Seines are restricted to 100 fathoms in length and gillnets to 150 fathoms. Similarly, the gillnet fleet has evolved from floating nets of 80-100 meshes of depth to sinking nets with 120-160 meshes in depth. Gear efficiency appears to have reached its maximum under the current regulations; no limit on gear depth exists for gillnets, but additional gear depth would be difficult to work. Herring originally were caught at or near their spawning area from 1978-1983. As fishermen's knowledge increased in identifying these areas, the herring have been intercepted in deeper waters further from their spawning destination.

The Alaska Department of Fish and Game, (ADF&G), relies on the fishing industry to establish roe recovery standards. Generally, tenders will have a processor representative onboard to ensure that marketable sac roe quality herring are harvested. Competition among shore-based processors and the high quality of sac roe results in this fishery having one of the highest ex-vessel value per ton in the state. The high quality of fish is obtained from in-season handling of a relatively small amount of herring over a long time period.

Fishery Monitoring

The ADF&G, Division of Commercial Fisheries manages this fishery from its Kodiak Office. From 1974 through 1991, the ADF&G has used a state vessel to monitor this fishery in bays which received the greatest fishing effort. In 1979 through 1991, in conjunction with

the state vessel, two person ADF&G field crews were also utilized to monitor the fishery. The annual harvest is distributed between 40-50 management units and there is a general sequence of harvest timing by groups of these units.

Field crews were stationed in anticipated harvest units, or bays, which have historically produced the major harvests for a district. Field crews are positioned in remote bays with chartered float planes or by vessel and are equipped with an inflatable boat or skiff powered with and outboard motor. Crews contact fishermen, spotters and tender operators on the grounds to obtain fishery data. Crews then report at least three times per day via single side band (SSB) radio critical information such as current harvest, effort levels, and fleet movements. Crews have been successful in keeping the herring harvest at GHL's and, for the most part, in preventing excessive harvests from occurring. Field crews have provided crucial data identifying spawning areas, collected age-weight-length (A-W-L) samples from the commercial harvest, and provided critical fishery performance information which is used to manage this fishery. Frequent ADF&G aerial surveillance of the entire area supplements and often directs in-season changes of fishery monitoring field crews. Industry spotter reports provide vital information concerning all aspects of the fishery. The ADF&G office staff, including an area and an assistant area management biologist, tally field crew, processor, and tender reports to assess herring harvests and decide from this information management units which may need to be closed to fishing. An annual "Kodiak Herring Sac Roe Harvest Strategy" is written and distributed which describes in detail the 1991 harvest strategy, (Appendix A.1).

METHODS

Fishing Seasons and Weekly Fishing Periods

The fishing season for the Kodiak herring sac roe fishery opened by regulation on 15 April with a closure scheduled for 30 June (ADF&G

1991 Reg. Book). The timing of the sac roe season seemed to have been delayed due to poor climatic conditions through the early part of the season, leaving many management units with little or no herring harvests. This late timing, along with interest by both processors and fishermen in quality sac roe herring, convinced the Department to extended the season through 6 July, 1991, thus allowing an additional three 24-hour fishing periods for interested fishermen.

Fishing periods are established by emergency order. As in the past 9 years, fishing periods began at 12:00 noon on odd numbered days, and closed at 12:00 noon on even numbered days of the month. Staggered days of fishing have the advantage of providing clearly defined closed periods which allows ADF&G staff time to assess, summarize, and update all harvest data from previous fishing periods, as well as comparisons between reported and actual harvests. Since 1979, the occurrence of excessive harvests within a management unit have primarily been prevented by these pre-established fishing periods.

Gear Types and Limits

During the herring sac roe season, only purse seine and gillnet gear may be used in the Kodiak Area. Purse seines are limited to a maximum of 1,025 meshes in depth and no more than 100 fathoms in length. Gillnet gear is limited to a total length of 150 fathoms. (ADF&G 1991 Reg. Book).

Districts and Management Units

The Kodiak Management Area is divided into seven districts which define geographical areas used in managing the sac roe and food\bait herring fisheries. For the sac roe fishery, each district is then broken into management units which are intended to define the spawning area used by a stock of herring or may be used to define a geographical area, (Figure 3).

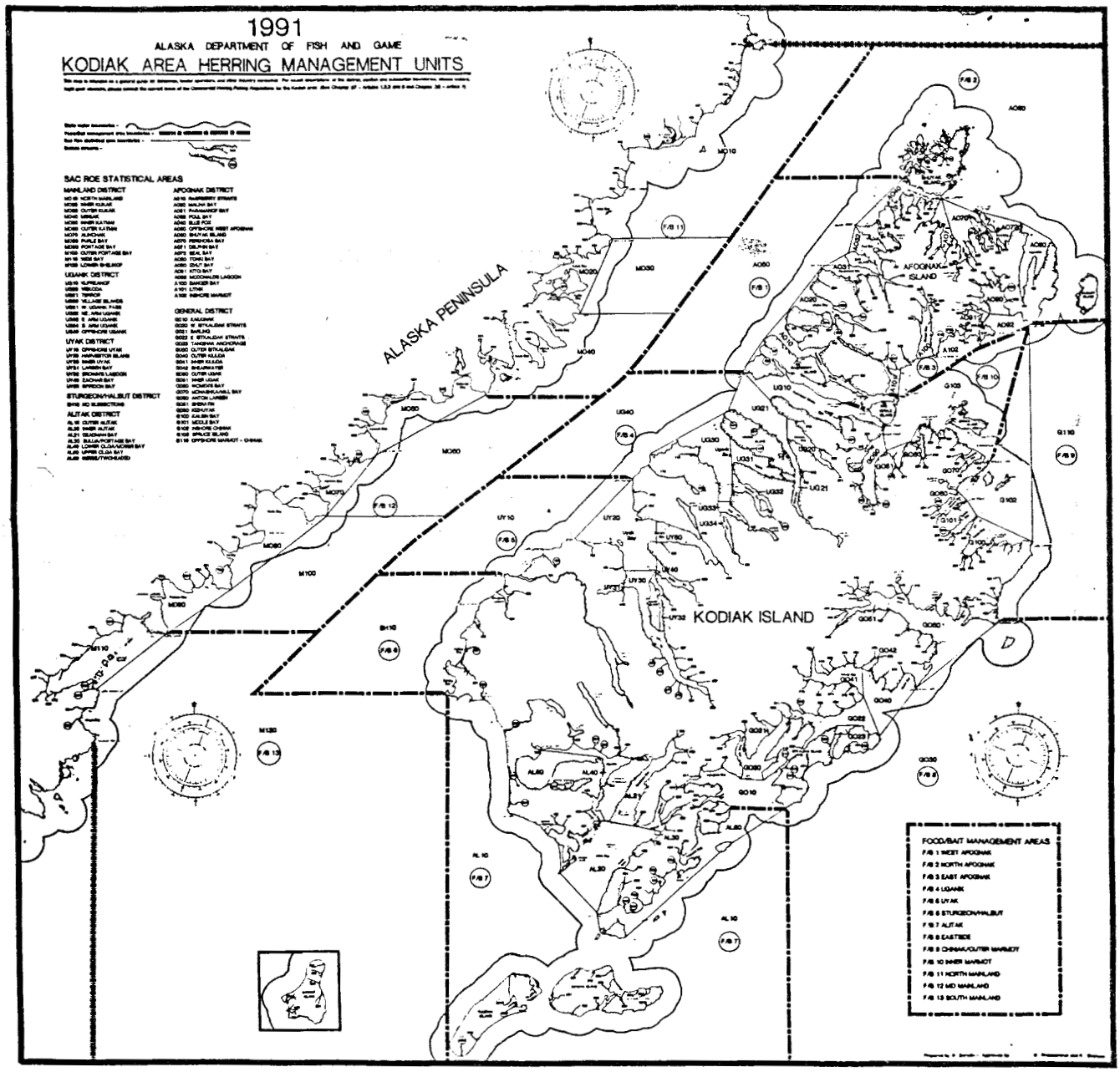

Figure 3. Map of the Kodiak Management Area with the statistical units for herring fishing shown.

Guideline Harvest Levels

Pre-season guideline harvest levels (GHL's) were established for all management units which have produced consistent herring harvests in previous seasons. These GHL's are meant to reflect the status of a particular stock of herring by management unit or district. Criteria for establishing the GHL include: 1) 1990 expected biomass vs. actual biomass estimates, 2) average school size, 3) trends in age composition, 4) level of recruitment (age-3), 5) proportion of the spawning population age-5 and younger, 6) proportion of age-2 fish in the spawning biomass (indicator of future recruit strength) and 7) spawn observations (extent, frequency, amount deposited). This information is supplemented by fishery performance information, namely the expected vs. actual harvest timing, harvest duration, and harvest level. Some management units are designated "exploratory" and are assigned no GHL because these areas have had sporadic or no harvest of herring in past years. In-season closures in these exploratory areas are used to ensure that excessive harvests are minimized. If at any time during the season it appears that pre-season expectations were incorrect, GHL's can be adjusted above or below pre-season levels. See Appendix A.1. concerning the in-season harvest strategy.

GHL's for the Kodiak area from 1979-1982 were fixed at 2,400 tons. The aforementioned criteria has been used from 1983-1991 to set a pre-season GHL for the Kodiak area. A comparison of the pre-season GHL's with the actual harvests is presented in Figure 4. These pre-season harvest projections aid fishermen and processors in planning prior to the start of each season.

In-season Fishery Management

In season managing of the sac roe fishery relies primarily on ADF&G field crews stationed in management units where harvests are anticipated. Daily reported harvest estimates are tabulated at least three times per day from these field crews. When a GHL is

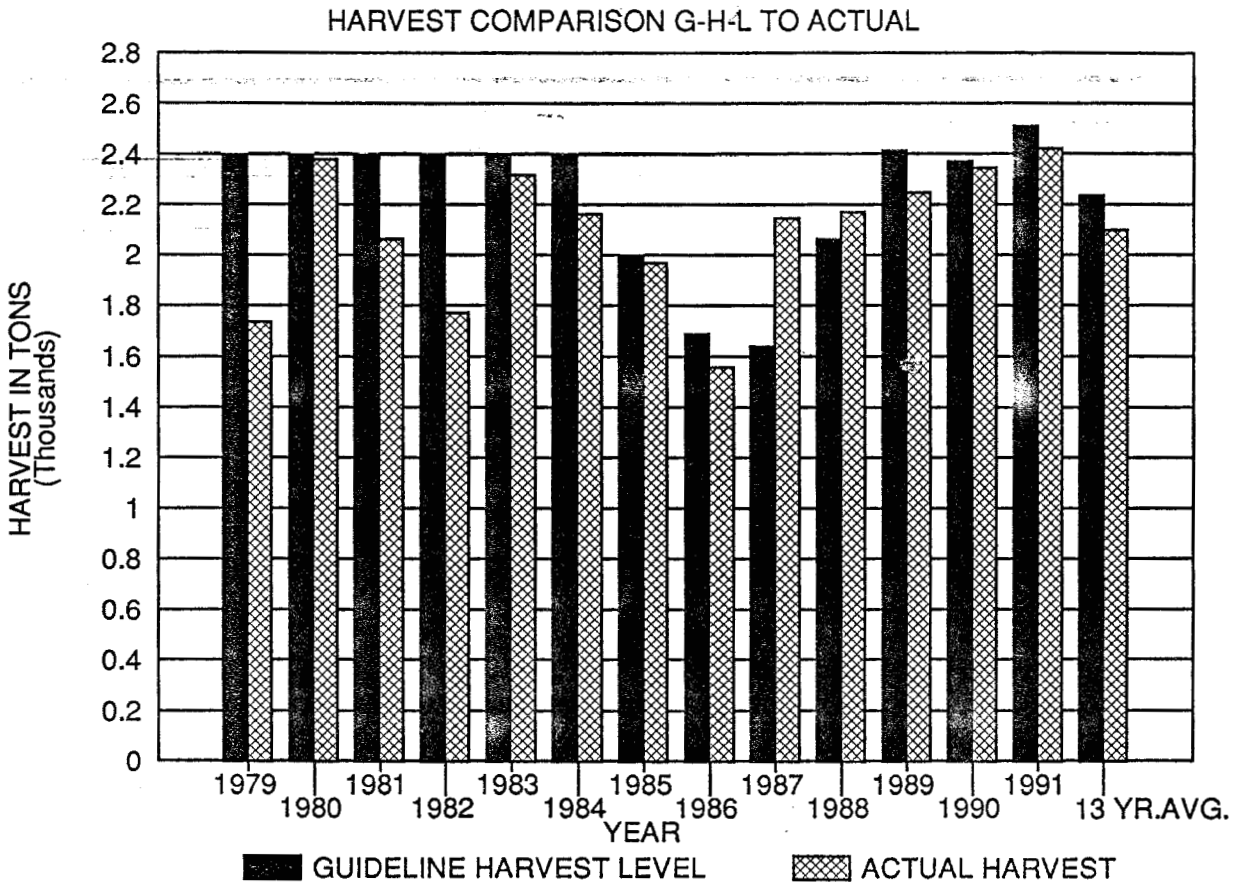

Figure 4. Comparison of herring guideline harvest levels to actual herring harvest for the Kodiak Management Area, 1979-1991.

obtained for a management unit, the field crew initiates notification of an impending management unit closure. Fishermen within the area are given as much prior notification time as possible, but due to the rapid pace at which the fishery occurs, notification time can be as brief as thirty minutes. In management units which do not have field crews present, ADF&G aerial surveys and timely accurate harvest reports from fishermen, spotters, and processors are used to assess herring harvests. Processors and independent tender operators are required to provide daily tallies of herring deliveries by management unit and accurate estimates of herring onboard tenders that have not yet delivered to the cannery. The management of the fishery is very dependent on the accurate and timely reporting of herring harvests, and past cooperation has been excellent. As reports of herring harvested reach or exceed GHL's, management units are closed by emergency order.

Commercial catch data is compiled by ADF&G, Division of Commercial Fisheries. These data are compiled post season from sales receipts (fish tickets) received from processors of purchased tonnages of herring they received from fishermen. Fish ticket data is then compiled with the aid of a computer and a summary of the herring harvest is generated. The ADF&G staff then edits this summary for errors and lost fish tickets.

Biomass Estimates

Previous attempts to estimate the total spawning biomass in the Kodiak Management Area by ADF&G with aerial surveys has been met with limited success. Aerial assessment provided only a limited evaluation and did not give a true representation of the herring stocks. Problems associated with aerial surveys in the Kodiak Area include: 1) Sac roe herring tend to spawn in the evening, night and early morning hours, limiting the time which surveys can be conducted, 2) Most management units have many distinct schools of herring which will spawn from April through June. An accurate estimation would require surveys during this 3 month period. 3)

Large numbers of juvenile herring, spawning herring, spawned out herring, and other fishes such as capelin can be found in herring sac roe fishery areas. These fish may stay within the fishery areas for the duration of the sac roe season or may move, so that aerial biomass estimates may be duplicated or be incomplete. 4) The large geographical area for the Kodiak Management Area, (57 management units which have identified spawning stocks), and the limited time per day which the herring would be congregated in shallower more visible survey waters. 5) Adverse weather conditions. Aerial surveys are very time consuming and expensive, which our current herring management budget would not allow. Industry (spotters) have helped greatly in past seasons by providing biomass estimates, spawn observations, fleet movements and harvest estimates. These spotters are very experienced, many having been involved for several seasons in the Kodiak Area and other statewide herring fisheries. Biomass estimates are compiled for each district from surveys flown by ADF&G and industry spotters. It has been estimated by both ADF&G and industry spotters that only 25% to 50% of the actual biomass is observed for the Kodiak Area herring stocks. There appears to be a significant amount of subtidal spawning occurring in waters 10-20 fathoms in depth. These fish and spawning activity may not be detected from aerial surveys. Previous attempts to assess this subtidal spawning with divers was not successful.

Commercial Catch Sampling

Commercial catch samples are taken from purse seine harvests, except when a unit may only have a gillnet harvest. Seine caught herring are used as they have no selectivity for any particular age class. Field crews collect several samples from different seine sets within a management unit to obtain a representative sample of all age classes present for each herring stock. Samples known to be taken from a single management unit are also taken from tenders and fishing boat deliveries to the cannery.

Commercial catch samples are analyzed for age, weight, length, sex, and sexual maturity.

A single scale is taken from each fish, from the preferred area located on the left side of the fish, three rows below the lateral line and three scales posterior to the center of the opercular plate (Brodie, personal communication 1991). The scale is visually analyzed with the aid of a microscope to determine the age of the fish in years.

Standard length measurements are taken on all herring sampled. This length is the straight line distance from the anterior most part of the fish, including the lower jaw with the mouth closed, to the end of the vertebra (hypural plate). Lengths are taken on all samples using a herring measuring board to the nearest millimeter.

Weight measurements are taken on a Mettler balance to the nearest gram. Weights are taken on a minimum of 50% of a sample, with smaller size samples, 100 fish and less, having all weights sampled.

Sex and sexual maturity are determined on all herring in a sample. Each fish is slit open and visually inspected for gonad relative maturity. The relative maturity is broken down into a scale of key characteristics ranging from virgin herring through spawned out herring, with eight levels of maturity identifying gonad key characteristics.

RESULTS

Harvest and Effort Summary

The 1991 Kodiak herring sac roe season was the longest (83 days) since this fishery developed in 1979, extending from 15 April through 6 July, (Table 3). A total of 2,432 tons of herring were harvested, which was 97% of the pre-season GHL of 2,510 tons.

Seine caught herring totalled 1,697 tons, which was 70% of the total harvest, while gillnet gear accounted for 735 tons, which was 30% of the total harvest. A comparison of harvest by gear type shows the averages from 1979-1991 was 74% seine harvest and 26% gillnet, (Table 3). During the period 1979-1991 seine and gillnets accounted for annual harvests of 1,550 and 550 tons respectively, (Figure 5). Roe recovery averaged 9.8% for seine caught fish and 10.7% for gillnet gear, for a combined average roe recovery of 10.1%. The average price per ton paid at the dock for 10% roe recovery herring was $850.00, with the total ex-vessel value of the fishery estimated at $2.07 million dollars.

A total of 32 seiners and 64 gillnetters fished during the 1991 season. This effort level is comparable to that of the past six years. Average ex-vessel earnings by seiners was estimated at $45,100 and $9,800 for gillnetters. Six buyers/processors participated during the 1991 season.

The 1991 Kodiak sac roe season was unique from the previous 12 years since this fishery developed. Spring climatic conditions from 1 April through 15 May were poor, with mixed rain and snow, cold temperatures, overcast and windy conditions. Near record rainfalls were experienced during April. These climatic conditions seem to have affected the timing and the number of herring entering into the fishery and spawning areas. Industry (spotter) aerial surveys were hampered by these unfavorable flying conditions and may have affected the ability to find sac roe quality herring which slowed harvest rates.

District Summaries

The 1991 distribution of herring harvest by district is similar to that of the past three years, and the 1991 harvests can be seen in (Figure 6) by gear type. Of the 72 management units in the Kodiak Management Area, 50 units had a herring harvest, and 30 of these units were closed by emergency order, (Table 4 and Appendix B.1).

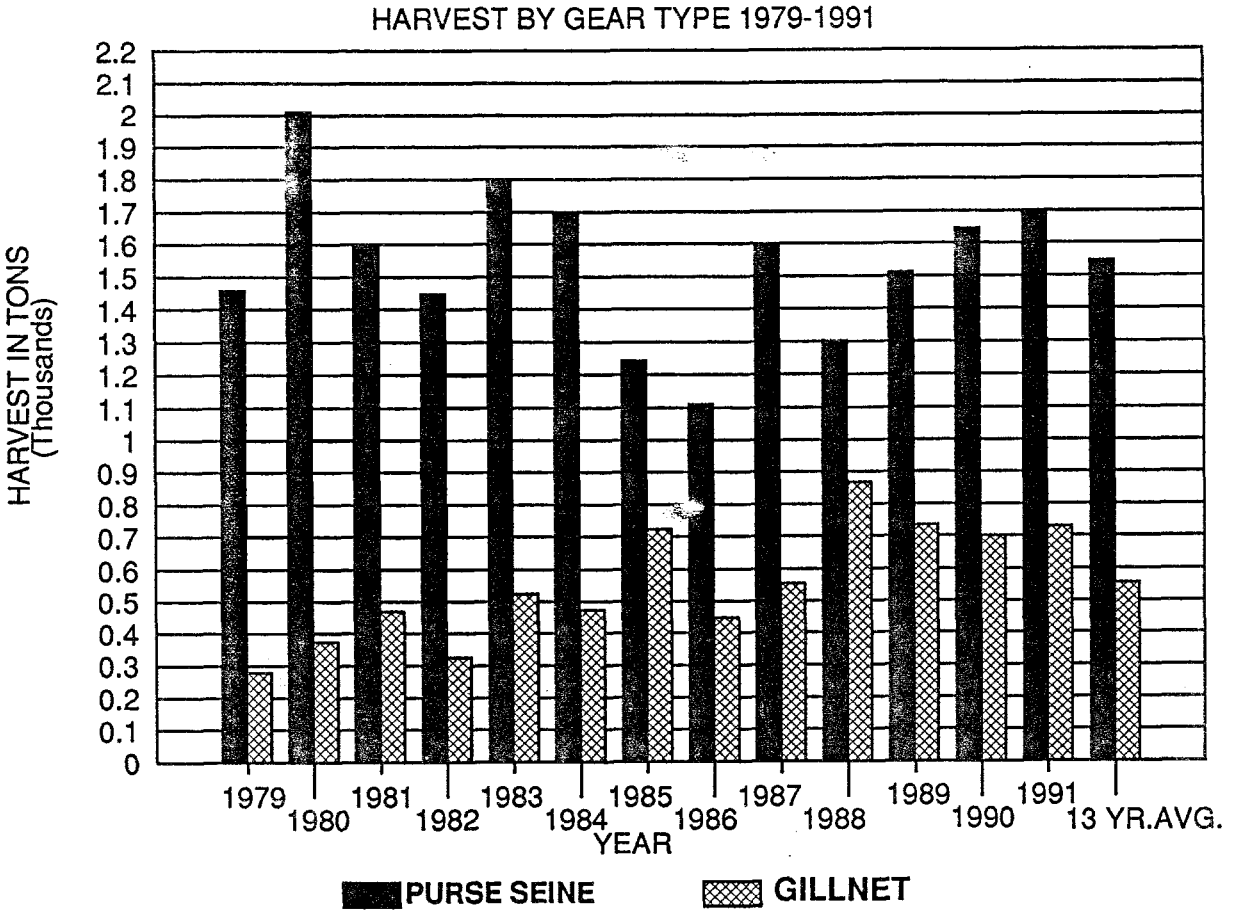

Figure 5. Comparison of herring harvests by gear type for the Kodiak Management Area, 1979-1991.

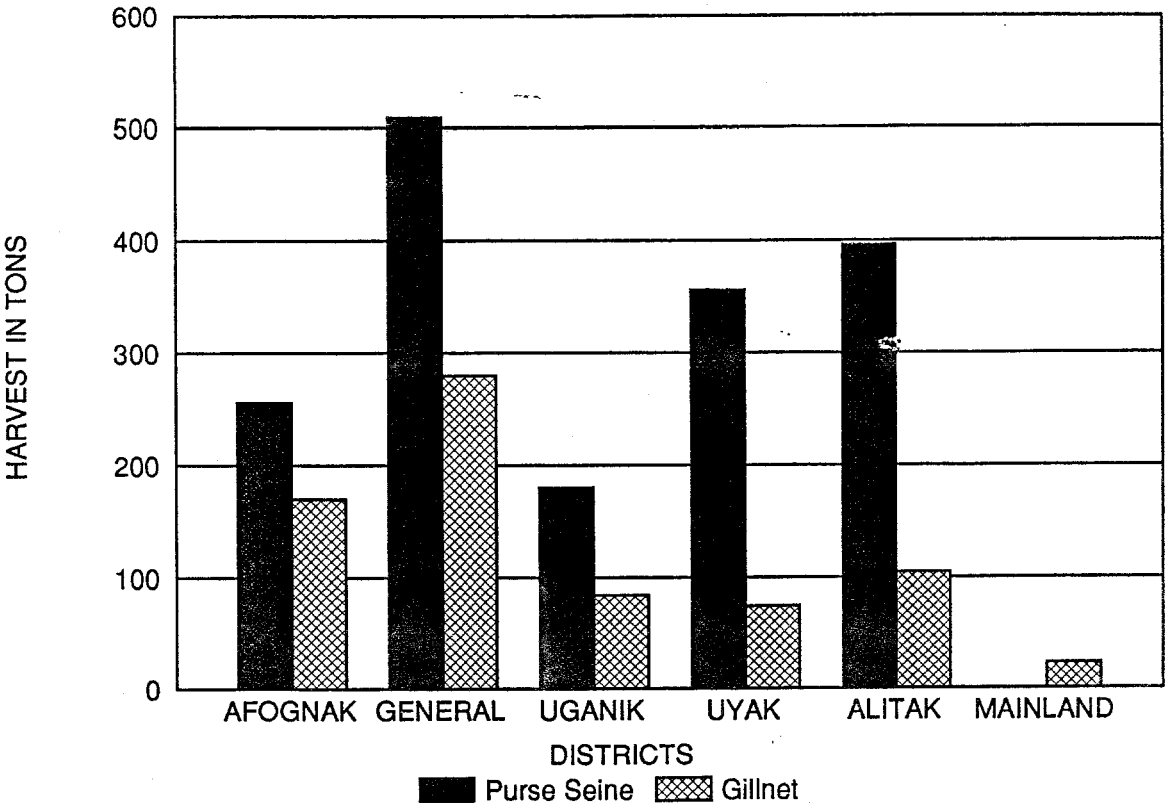

Figure 6. Sac roe herring harvest by district and gear type for the Kodiak Management Area, 1991.

Table 4. Harvest summary by gear, district, management unit, guideline harvest level, and unit closure dates, 1991.

STAT. AREA	MGMT. UNITS	GUIDELINE HARVEST LEVEL	PURSE SEINE	%GILLNET		%	TOTAL	DATE CLOSED
AFOGNAK DIST.								
A010	Raspberry Sts.	110 TONS	1.6	1	115.0	99	116.6	5/14
A020	Malina Bay	30 TONS	54.3	94	3.3	6	57.6	4/21
A031	Paramanof Bay	40 TONS	188.1	92	16.4	8	204.5	4/29
A032	Foul Bay	20 TONS	0	-	22.6	100	22.6	4/28
A040	Devils Inlet	10 TONS	0	-	0	-	0	7/06
A040	Blue Fox	10 TONS	0	-	0	-	0	7/06
A050	Offshore W. Afog.[a]	-	0	-	0	-	0	7/06
A060	Shuyak Is.	20 TONS	0	-	0	-	0	7/06
A070	Perenosa Bay	15 TONS	11.6	100	0	-	11.6	5/18
A071	Delphin Bay	10 TONS	0	-	1.1	100	1.1	7/06
A072	Seal Bay	10 TONS	0	-	0	-	0	7/06
A080	Tonki Bay	15 TONS	0	-	0	-	0	7/06
A090	Izhut Bay	25 TONS	0	-	6.5	100	6.5	7/06
A091	Kitoi Bay	15 TONS	0	-	1.0	100	1.0	7/06
A092	MacDonalds Lagoon	10 TONS	0	-	0	-	0	7/06
A100	Danger Bay	20 TONS	0	-	4.3	100	4.3	7/06
A101	Litnik	10 TONS	0	-	0	-	0	7/06
A102	Duck Bay	10 TONS	0	-	0	-	0	7/06
District Totals		380 TONS	255.6	60	170.2	40	425.8	

-Continued-

Table 4. (page 2 of 5)

STAT. AREA	MGMT. UNITS	GUIDELINE HARVEST LEVEL	PURSE SEINE	%GILLNET		%	TOTAL	DATE CLOSED
UYAK DISTRICT								
UY10	Offshore Uyak[a]	-	0	-	0	-	0	7/06
UY20	Harvester Island	10 TONS	0	-	0	-	0	7/06
UY30	Inner Uyak	240 TONS	152.2	94	9.0	6	161.2	7/06
UY31	Larsen Bay	10 TONS	0	-	8.1	100	8.1	7/06
UY32	Browns Lagoon	20 TONS	10.9	64	6.2	36	17.1	6/04
UY40	Zachar Bay	100 TONS	94.2	87	13.7	13	107.8	6/04
UY50	Spiridon Bay	160 TONS	98.7	73	37.3	27	136.0	7/06
District Totals		540 TONS	356.0	83	74.3	17	430.3	
UGANIK DIST.								
UG10	Kupreanof	10 TONS	0	-	0.8	100	0.8	7/06
UG20	Viekoda	20 TONS	23.9	95	1.1	5	25.1	6/16
UG21	Terror	60 TONS	13.6	77	4.0	23	17.6	7/06
UG21	Uganik Is. Lagoon[b]	0 TONS	0	-	0	-	0	7/06
UG30	Village Island	35 TONS	42.2	84	8.0	16	50.2	5/12
UG31	W. Uganik Pass	20 TONS	23.6	60	15.9	40	39.5	5/16
UG32	NE Arm Uganik	75 TONS	36.0	91	3.4	9	39.4	7/06
UG33	E. Arm Uganik	40 TONS	8.8	16	47.3	84	56.1	5/22
UG34	S. Arm Uganik	40 TONS	32.4	89	4.1	11	36.5	6/14
UG40	Offshore Uganik[a]	-	0	-	0	-	0	7/06
District Totals		300 TONS	180.5	70	84.6	30	265.1	

-Continued-

Table 4. (page 3 of 5)

STAT. AREA	MGMT. UNITS	GUIDELINE HARVEST LEVEL	PURSE SEINE	%GILLNET		%	TOTAL	DATE CLOSED
ALITAK DIST.								
AL10	Outer Alitak	(Exploration)	0	-	0	-	0	7/06
[A]L20	Inner Alitak	(Exploration)	52.6	80	12.9	20	65.5	5/30
AL21	Deadman Bay	155 TONS	148.4	82	32.2	18	180.5	5/28
AL30	Sulua/Portage Bay	75 TONS	65.1	70	28.5	30	93.6	5/26
AL40	Lower Olga/Moser	15 TONS	12.0	100	0	-	12.0	6/11
AL40	N. Upper Olga B.	10 TONS	0	-	0	-	0	6/11
AL50	Upper Olga Bay	190 TONS	118.6	80	30.7	20	149.3	7/06
AL60	Geese/Twoheaded	(Exploration)	0	-	0	-	0	7/06
District Totals		445 TONS	396.7	79	104.3	21	500.9	
STURGEON/HALIBUT DIST.								
SH10	Sturgeon/Halibut	(Exploration)	0	-	0	-	0	-
GENERAL DISTRICT								
GO10	Kaiugnak	10 TONS	0	-	0	-	0	7/06
GO20	W. Sitkalidak St.	65 TONS	0	-	67.1	100	67.1	4/30
GO21	Barling	20 TONS	137.6	86	22.4	14	160.0	4/15
GO22	E. Sitkalidak St.	95 TONS	58.6	55	48.4	45	106.9	4/23
GO23	Tanginak Anchorage	15 TONS	0	-	6.5	100	6.5	7/06
GO30	Outer Sitkalidak	(Exploration)	0	-	0	-	0	7/06
GO40	Outer Kiliuda	(Exploration)	0	-	0	-	0	7/06
GO41	Inner Kiliuda	10 TONS	14.2	100	0	-	14.2	4/22

-Continued-

Table 4. (page 4 of 5)

STAT. AREA	MGMT. UNITS	GUIDELINE HARVEST LEVEL	PURSE SEINE	%GILLNET	GILLNET	%	TOTAL	DATE CLOSED
G042	Shearwater	25 TONS	43.1	100	0	-	43.1	4/22
G050	Pasagshak	25 TONS	0	-	0	-	0	7/06
G050	Outer Ugak	(Exploration)	50.9	100	0	-	50.9	6/02
G051	Inner Ugak	50 TONS	91.8	100	0	-	91.8	5/12
G060	Womens Bay	110 TONS	68.2	61	42.9	39	111.1	7/06
G070	Monashka/Mill B.	(Exploration)	0	-	0	-	0	7/06
G080	Anton Larsen	15 TONS	0	-	3.2	100	3.2	7/06
G081	Sheratin	10 TONS	3.3	85	0.6	15	3.9	7/06
G090	Kizhuyak	110 TONS	20.1	19	83.9	81	104.0	6/01
G100	Kalsin Bay	15 TONS	5.6	61	3.6	39	9.2	7/06
G101	Middle Bay	20 TONS	15.0	97	0.4	3	15.4	7/06
G102	Inshore Chiniak	10 TONS	0	-	0	-	0	7/06
G103	Spruce Island	10 TONS	0	-	0	-	0	7/06
District Total		615 TONS	508.4	65	279.0	35	787.4	
MAINLAND DIST.								
M010	North Mainland	(Exploration)	0	-	0	-	0	7/06
M020	Inner Kukak	50 TONS	0	-	22.7	100	22.7	7/06
M030	Outer Kukak[a]	-	0	-	0	-	0	7/06
M040	Inner Missak	(Exploration)	0	-	0	-	0	7/06
MO40	Outer Missak[a]	-	0	-	0	-	0	7/06
M050	Inner Katmai	50 TONS	0	-	0	-	0	7/06
M060	Outer Katmai[a]	-	0	-	0	-	0	7/06

-Continued-

Table 4. (page 5 of 5)

STAT. AREA	MGMT. UNITS	GUIDELINE HARVEST LEVEL	PURSE SEINE	%GILLNET		%	TOTAL	DATE CLOSED
M070	Alinchak	30 TONS	0	-	0	-	0	7/06
M080	Puale Baya	(Exploration))	0	-	0	-	0	7/06
M090	Portage Bay	(Exploration)	0	-	0	-	0	7/06
M100	Outer Portage[a]	-	0	-	0	-	0	7/06
M110	Wide Bay	100 TONS	0	-	0	-	0	7/06
M120	Lower Shelikof	(Exploration)	0	-	0	-	0	7/06
District Total		230 TONS	0	-	22.7	100	22.7	
GRAND TOTAL		2,510 TONS	1,697	70	735.8	30	2,432.0	

[a] These are offshore management units which are not expected to yield herring of sac-roe quality. These units are more applicable to the food/bait fishery. (See Herring Food/Bait Fishery Management Plan.)

[b] The spawning biomass has probably been reduced to less than 50 tons and the unit is closed to fishing.

Afognak District

The bays of Afognak Island are among the earliest areas which herring are harvested. The timing of herring moving into bays to spawn seems to have been delayed by the adverse spring climatic conditions experienced in 1991. ADF&G stationed three field crews and the state vessel, M/V COHO, in management units which were anticipated to have herring harvests. Field crews were moved to new management units when the management unit they monitored was closed by emergency order or effort levels were less than anticipated. The M/V COHO monitored Paramanof and Foul Bay units beginning on 15 April. Field crews monitored the following management units: Crew #1 (Malina Bay then moved to Raspberry Straits), Crew #2 (Danger Bay), Crew #3 (Kitoi Bay, Izhut Bay, McDonald's Lagoon). Fishery activity was slow until 21 April, when 58 tons of herring were harvested in Malina Bay, closing that unit. The Foul Bay area had a harvest of 23 tons by gillnetters and was closed 28 April. The herring which were caught in the Foul Bay Management Unit were likely to have been traveling to inner Paramanof Bay, and were intercepted near the boundary of these two units. A change is needed in the boundaries for these two units so that harvests are properly assigned to the correct stock. The Foul Bay herring stock actually sustained a minor harvest in 1991, (1-3) tons, and the Paramanof Bay stock had a 20 ton additional harvest which is not shown in the fish ticket data. Paramanof Bay was closed on 29 April, after a single purse seine set netted 171 tons of herring; the GHL was 40 tons for this unit. This set was the largest ever made within the Kodiak Area. Roe recovery from this set was low due to high numbers of age-3 fish present and due to a lack of tender capacity to load the fish immediately after capture. Most of the catch was held over night and spawned in the seine; the remainder were compressed within the seine during the loading process, which took several days. The Raspberry Straits Management Unit has seen an increase in the spawning biomass during the past three years. Purse seine harvest from this area was limited due to the high percentage of age-3 herring present, which reduced roe percentages to unmarketable quality. Gillnets, due to the

selectivity of the gear for larger and older herring, were able to miss the age-3 fish and harvest the age-4 and older herring. The Raspberry Strait management unit closed on 14 May with a total harvest of 117 tons. Perenosa Bay had a seine harvest of 12 tons which resulted in this unit being closed on 18 May by emergency order due to this harvest approaching the GHL. No other emergency orders were issued for this district. Another four management units had a combined harvest of 13 tons, none of these units approached the GHL's. Of the 17 management units of the Afognak District which have GHL's, four were closed by ADF&G field crews, one by ADF&G office staff, and the remainder were open through 6 July. The total GHL's for the District was 380 tons, a total of 426 tons were harvested with 60% of the harvest coming from purse seine gear and 40% from gillnet gear.

Uganik District

For the first time, an ADF&G crew was stationed in West Uganik Passage with a 21 foot skiff. This crew was able to monitor seven of the nine management units within this district. Fishing activity was slow to develop, with the timing of the fishery an average of two weeks later than most seasons. The M/V COHO assisted in this district, closing the Village Island Unit on 12 May with a harvest of 50 tons and a GHL of 35 tons. The West Uganik Passage Unit was closed 16 May by the ADF&G field crew, with a harvest of 39 tons and a GHL of 20 tons. The ADF&G field crew then moved their camp to East Arm Uganik on 14 May. Gillnet effort concentrated in East Arm Uganik, with 30 vessels present. Several seiners were also in the area. The field crew closed this management unit on 22 May with a harvest of 56 tons and a GHL of 40 tons. The field crew returned to Kodiak after this closure. On 24 May, the M/V COHO was moved from monitoring duties in Uyak Bay to the Northeast Arm Uganik Bay. Seiners were reported to be involved in harvesting herring for bait purposes. Several large schools of herring were located along Starr Point, in N.E. Arm Uganik Bay. These seiners combined to catch 33 tons of herring which was predominantly age-3 fish. These herring averaged 94

grams in weight with a roe recovery of 8.5%. Additionally, 6 tons of sac roe quality herring were harvested from N.E. Arm Uganik, with a GHL of 75 tons. The South Arm Uganik and Viekoda Bay management units were closed on 14 and 16 June respectively from processor and fishermen information. A total of 36 tons were harvested from the South Arm Uganik, (the GHL was 40 tons), with sac roe quality from this unit was excellent averaging 12.9%. The Kupreanof Straits management unit had a gillnet harvest of less than a ton, the GHL was 10 tons, and this unit remained open until 6 July. The Terror Bay management unit had an 18 ton harvest with a 60 ton GHL, and closed on 6 July. Large numbers of age-2 and 3-year-old herring were present in this area and the outlook for this unit is good. A district total of 265 tons were harvested from a district GHL of 300 tons, 70% of this harvest was with purse seine gear and 30% by gillnet.

General District

The timing of herring into the General District was more normal than compared to all other districts of the Kodiak Management Area. The management units along the eastside of Kodiak had experienced spawning in some areas prior to the 15 April fishery opening date. An ADF&G two person field crew was stationed in Amee Bay. They were equipped with a 22 foot skiff which enabled them to monitor seven management units along the Eastside of Kodiak Island. Weather conditions delayed the stationing of the ADF&G field crew prior to the first opening. Consequently, 160 tons of herring were harvested from the Barling Bay management unit, which had a 20 ton GHL. The field crew closed this management unit the day they arrived on 15 April. On 22 April, both the Shearwater and Inner Kiliuda Bay management units were closed with harvests of 43 tons, (GHL 25 tons) and 14 tons, (GHL 10 tons) respectively. The field crew first received information from local purse seiners concerning harvests from these areas, which was confirmed by processor reports. The East Sitkalidak Straits management unit was closed by the field crew on 23 April with a harvest of 107 tons and a GHL of 95 tons. The West Sitkalidak Straits management unit was closed by

ADF&G office staff at the 12:00 noon closure time on 30 April, with a harvest 67 tons for a GHL of 65 tons in this unit. The field crew and skiff were moved to the Alitak District on 5 May with the assistance from the commercial fleet. The Inner Ugak Bay management unit was closed by the ADF&G office staff on 12 May with a harvest of 92 tons and a GHL of 50 tons for this unit. A field crew is generally stationed in this unit but funding restraints prohibited on site monitoring. On 2 June, an exploratory area yielded a 51 ton harvest in the Outer Ugak management unit, which resulted in a partial closure of that unit. The ADF&G crew from Danger Bay (Afognak District) was moved to the Kizhuyak Bay management unit (General District), on 8 May. Fishery performance was slow, and this management unit was closed short of the 110 ton GHL, at 104 tons. No other emergency orders were issued for the General District; six additional management units had herring harvests which totalled 149 tons. The Womans Bay management unit reached the GHL on the last day of the season 6 July. Of the 21 management units in the General District, two units were closed by the ADF&G field crew, four units closed from the combined efforts of ADF&G office and field crew information gathering, two units were closed by the ADF&G office staff, and the remaining 13 units remained open until 6 July. The total GHL for the General District was 615 tons. A total of 787 tons were actually harvested, with 65% of the harvest from purse seine gear and 35% of the harvest from gillnet gear.

Uyak District

An ADF&G field crew was stationed in the Zachar Bay management unit with the M/V COHO monitoring the remaining six management units. The Uyak District is comprised of seven management units and only two of these units were closed by emergency order in 1991. The Zachar Bay management unit was closed on 4 June with a harvest of 108 tons, (the GHL was 100 tons). Information gathered by the Zachar Bay field crew and the M/V COHO revealed that the 20 ton GHL had been met or exceeded in the Brown's Lagoon unit and it was closed on 4 June, (the actual harvest was 17 tons). The M/V COHO

monitored all management units within the district, shifting to different units as the fishing fleet moved. In past years, the Spiridon and Zachar Bay units were the first to have significant herring harvests, followed by harvests in the Inner Uyak Bay unit. The timing of this fishery occurred 2-3 weeks later than most recent seasons. It is suspected that spawning may have occurred in these units prior to the presence of fishermen. During this season, sporadic showings of herring were present in all units, but overall school sizes were down from previous years. With large concentrations of age-3 herring were present in all of these units, the future outlook for these units is good. By 7 June, the majority of herring fishermen had quit to prepare for the upcoming salmon season. Herring harvest rates were low, and the chances of having an excessive over harvest by not having an ADF&G crew present seemed unlikely. ADF&G management staff had other needs for the M/V COHO in preparation for the salmon season and the vessel returned to Kodiak on 7 June. Harvests from the Larsen Bay management unit totalling 8 tons, (GHL of 10 tons), Inner Uyak Bay management unit of 161 tons, (GHL 240 tons), and the Spiridon Bay management unit 136 tons, (GHL 160 tons). The Uyak District GHL was 540 tons with an actual harvest of 430 tons 83% of the harvest was taken by purse seine gear and 17% by gillnet gear.

Alitak District

The Alitak District is comprised of a total of eight management units, three are exploratory areas, and five have GHL's. An ADF&G crew and skiff were moved from the General District to the Alitak District on 6 May. The crew established a field camp in Sulua Bay and monitored this and the Deadman Bay management units. The Sulua/Portage Bay management unit was closed on 26 May with a harvest of 94 tons, (GHL 75 tons). The ADF&G field crew closed the Deadman Bay management unit on 28 May with a harvest of 180 tons, (GHL 155 tons). The Inner Alitak Bay management unit, an exploratory unit, was closed on 11 June with a harvest of 12 tons, (GHL 15 tons). To prevent the disturbance of sockeye salmon, (*Oncorhynchus nerka*), returning to their spawning stream, the Dog

Salmon River, the North Upper Olga Bay management unit was closed. No harvest was made in this unit with a GHL of 10 tons. On 31 May, a field crew was moved to Olga Creek to monitor the herring fishery in the Upper Olga Bay management unit and to operate a nearby salmon escapement weir. A total of 149 tons were harvested (GHL 190 tons), and boats stopped fishing by 30 June due to slow fishery performance and the on going salmon season. The other two exploratory management units had no harvests. The GHL for the Alitak District was 445 tons, and the actual harvest was 501 tons 79% of the harvest was taken with purse seine gear and 21% from gillnet gear.

Mainland District

The Mainland District is comprised of 13 management units, four which have GHL's, five which are exploratory, and four units are offshore which were not expected to produce a sac roe harvest. The Mainland District experiences more extreme weather conditions than the other districts around Kodiak and Afognak Islands. Sea conditions encountered while crossing the Shelikof Strait to reach this district greatly reduces the mobility of vessels which fish this district. The Mainland District frequently experiences high winds, low ceilings, and limited visibility, greatly limiting the effectiveness of spotters. Fishing effort in this district generally involves only one or two seine combines and 5-10 gillnet vessels. Several management units on the southern part of this district are the farthest units from the port of Kodiak. No field crews are stationed in this district due to the high expense of placing and supplying crews in this remote area. The weather conditions, combined by the small number of vessels which fish these units reduces the likelihood that excessive harvests will occur. The Inner Kukak management unit had a harvest of 23 tons (GHL 50 tons) by gillnetters over a three week period in May. During periods of flyable weather conditions several spotters were able to locate concentrations of herring. These herring were either immature or had spawned before the seiners arrived and were released.

Age Composition, Weights, and Lengths

During the 1991 season, age-3 and 4-year-old herring comprised 76% of the commercial seine harvest, (Figure 7). Age-3 herring are considered "recruit herring", entering into the commercial fishery and spawning for the first time. The age-3 herring comprised 26% of the harvest during the 1991 season. The small sized roe sacs from age-3 herring are less marketable and profitable for fishermen and the processing industry. A comparison of age frequency by management units for the 1991 season is presented in (Figure 8 and Table 5). A comparison of age frequency by management unit for the years 1982 through 1991 can be seen in Appendix C.1.

A comparison of overall lengths of herring by each age class can be seen in (Figure 9). The lengths of herring sampled during the 1991 season are comparable to the past four years, showing no changes in growth rates.

A comparison of weights of herring at various ages can be seen in (Figure 10 and Table 6). The weights of herring age-3 have shown a decrease in average weight which were harvested in 1991. All other age classes had comparable growth rates to the past four years.

Spawning Biomass

In 1991, the spawning biomass index for that portion of the Kodiak Area fished was estimated at 20,000 tons as determined by industry spotter surveys and ADF&G surveys. A breakdown by district includes; 3,000 tons in the Afognak District, 5,000 tons in the General District, 4,000 tons in the Uganik District, 2,800 tons in the Uyak District, 4,200 tons in the Alitak District, and 1,000 tons in the Mainland District. The sac roe harvest of 2,432 tons represented a total indexed exploitation rate of 11%. This rate is lower than most years, which generally ranged from 28-41%. The rate could have been much higher in 1991, but with the presence of

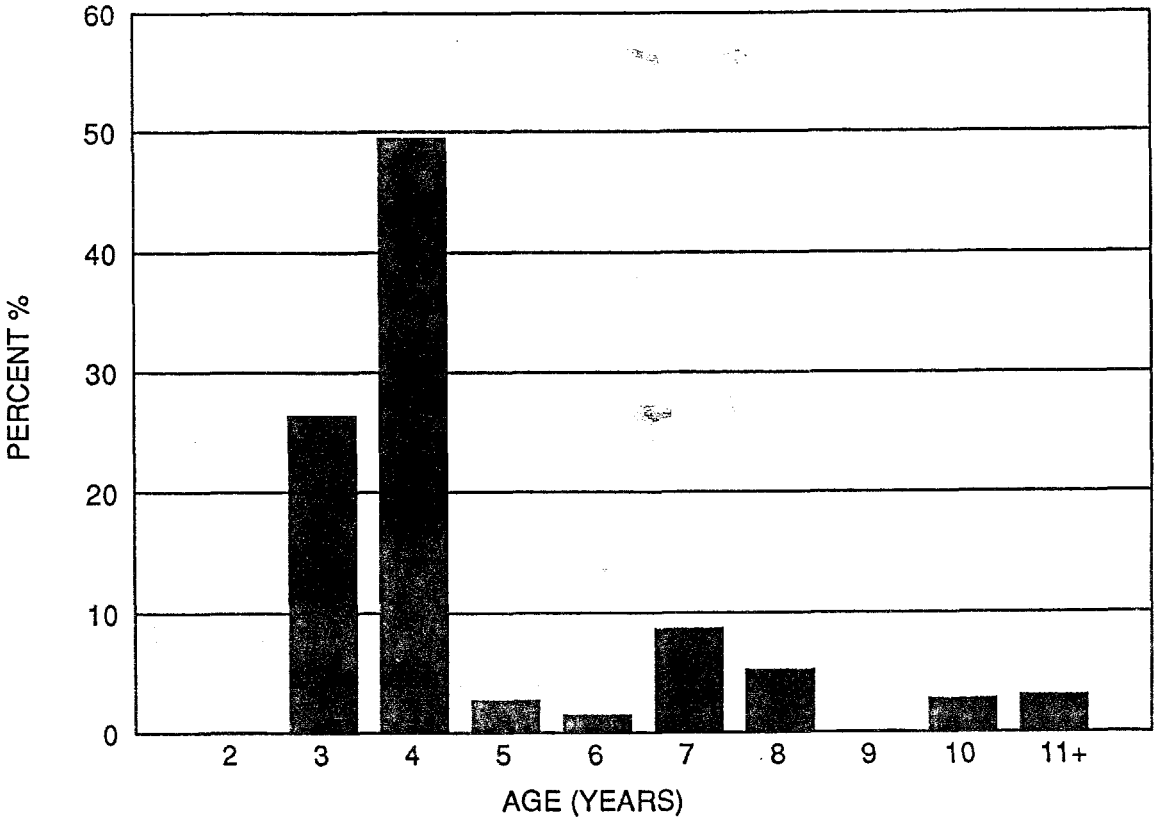

Figure 7. Herring age composition for the Kodiak Management Area, 1991.

Figure 8. Age frequency comparisons by management unit for the Kodiak Management Area, 1991.

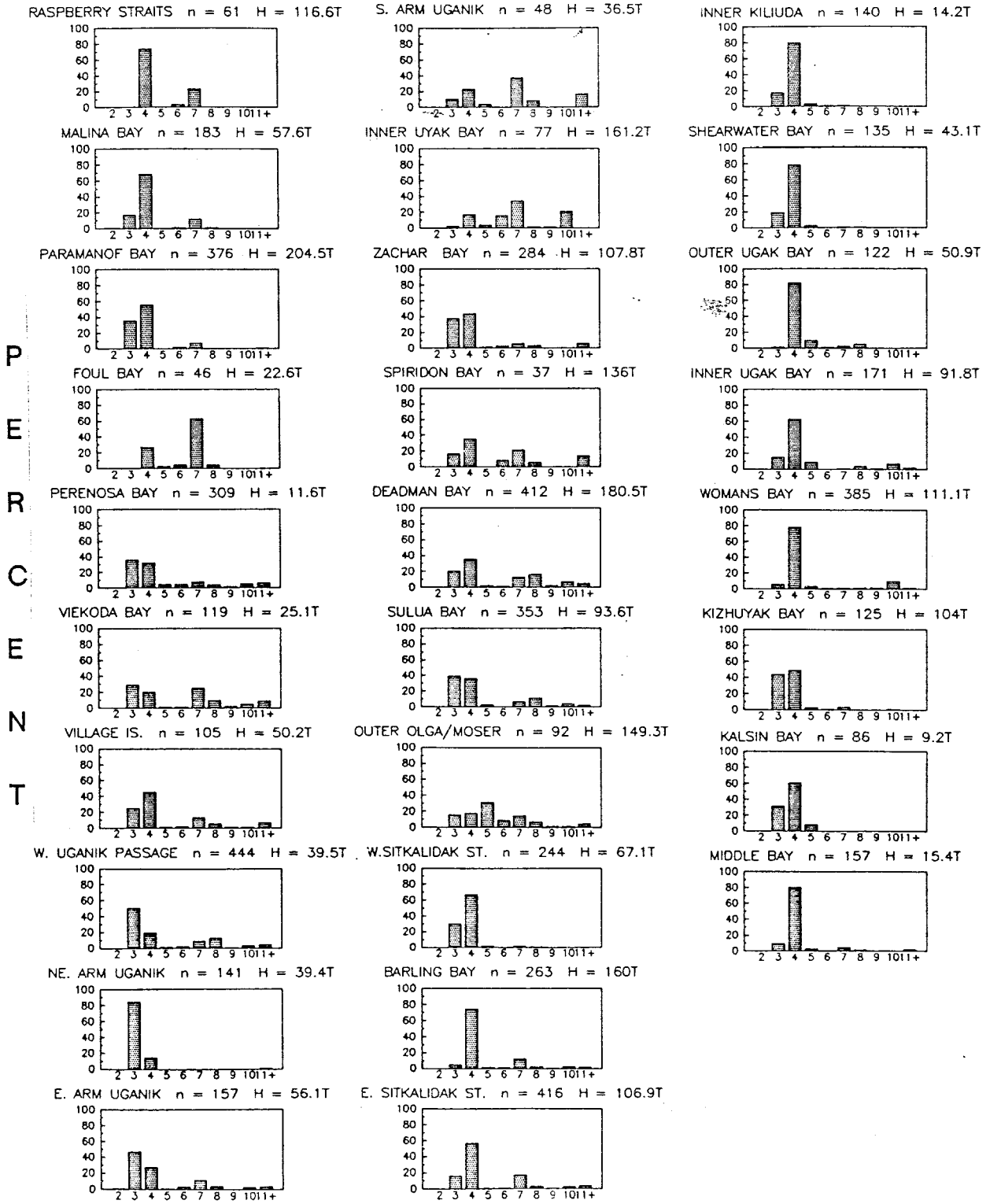

Table 5. Summary of age composition by percent of herring sac roe stocks for the Kodiak Management Area, 1991[a,b].

STOCK NAME[b] MGMT. UNIT	HARVEST[b] (TONS)	SAMPLE DATE	AGE COMPOSITION (%) 2	3	4	5	6	7	8	9	10	11+	N
Raspberry/Muskomee (Gillnet)	**116.6**	5/14	-	-	73.8	-	3.3	23.0	-	-	-	-	61
Malina Bay	**57.6**	4/21	.5	16.9	67.8	-	1.1	12.0	1.6	-	-	-	183
Paramanof Bay	**204.5**	4/29	-	35.1	55.1	.3	1.9	6.9	.3	-	-	.5	376
Foul Bay	**22.6**	4/28	-	-	26.1	2.2	4.3	63.0	4.3	-	-	-	46
Perenosa Bay	**11.6**	5/12	-	35.6	32.0	4.2	4.5	7.4	3.9	1.0	5.2	6.1	309
Viekoda Bay	**25.1**	6/16	-	28.6	20.2	.8	.8	25.2	9.2	1.7	5.0	8.4	119
Village Islands	**50.2**	5/12	-	24.8	44.8	1.0	1.9	13.3	5.7	1.0	1.0	6.7	105
W. Uganik Pass	**39.5**	5/11-16	-	50.2	18.9	1.1	1.4	8.6	12.4	.2	2.9	4.3	444
N.E. Arm Uganik	**39.4**	5/26	-	84.4	14.9	-	-	-	-	-	-	.7	141
E. Arm Uganik	**56.1**	5/20-21	.6	46.5	27.4	.6	3.2	11.5	3.8	-	2.5	3.8	157
S. Arm Uganik	**36.5**	5/14	-	10.4	22.9	4.2	-	37.5	8.3	-	-	16.7	48
Inner Uyak Bay	**161.2**	6/18	-	2.6	16.9	3.9	3.9	15.6	33.8	1.3	1.3	20.8	77
Zachar Bay	**107.8**	5/14-23	-	37.3	43.3	1.1	2.8	6.0	3.5	-	.4	5.6	284
Spiridon Bay	**136.0**	5/23	-	16.2	35.1	-	8.1	21.6	5.4	-	-	13.5	37
Deadman Bay	**180.5**	5/20-28	.2	20.1	35.0	1.7	1.2	12.4	16.5	1.7	6.8	4.4	412
Sulua Bay	**93.6**	5/20-26	-	38.5	35.7	2.0	-	6.2	11.0	1.1	3.7	1.7	353
Outer Olga/Moser Bay	**149.3**	6/10	-	15.2	17.4	31.5	8.7	14.1	6.5	1.1	1.1	4.3	92
W. Sitkalidak Strait	**67.1**	4/24	-	29.5	67.2	1.2	-	1.6	.4	-	-	-	244
Barling Bay	**160.0**	4/15	-	4.6	74.5	1.5	.8	12.2	2.3	.4	2.3	1.5	263
E. Sitkalidak (Amee Bay)	**106.9**	4/16-23	-	15.9	56.5	.7	.7	16.3	2.4	1.0	2.4	4.1	416
Inner Kiliuda Bay	**14.2**	4/22	-	16.4	79.3	2.9	.7	.7	-	-	-	-	140
Shearwater Bay	**43.1**	4/22	-	18.5	77.8	2.2	-	.7	.7	-	-	-	135
Outer Ugak Bay	**50.9**	6/1	-	.8	82.0	9.0	.8	2.5	4.9	-	-	-	122

-Continued-

Table 5. (page 2 of 2)

STOCK NAME[b] MGMT. UNIT	HARVEST[b] (TONS)	SAMPLE DATE	AGE COMPOSITION (%) 2	3	4	5	6	7	8	9	10	11+	N
Inner Ugak Bay	**91.8**	5/12	-	15.2	62.6	8.8	-	.6	3.5	.6	7.0	1.8	171
Woman's Bay	**111.1**	5/12-29	-	5.2	78.2	3.1	.3	1.0	1.0	1.0	9.1	1.0	385
Kizhuyak	**104.0**	5/12-21	-	44.0	48.8	2.4	.8	3.2	-	-	.8	-	125
Kalsin Bay	**9.2**	5/20	-	31.3	60.4	8.3	-	-	-	-	-	-	96
Middle Bay	**15.4**	5/23-31	-	9.6	80.3	2.5	-	4.5	1.3	-	-	1.9	157
28 MGMT. UNITS	**2,261.8**		**.05**	**26.3**	**49.4**	**2.6**	**1.4**	**8.7**	**5.2**	**.6**	**2.7**	**3.05**	**5,498**

[a] All samples were from commercial purse seine catches collected by ADF&G personnel except the Raspberry Strait/Muskomee Bay sample was from a commercial gillnet catch collected by ADF&G personnel.

[b] Of the 42 stocks exploited in 1991, samples were collected from 28 (67%). These 28 stocks yielded 2,261.8 tons, or 93% of the management area's total harvest of 2,432 tons.

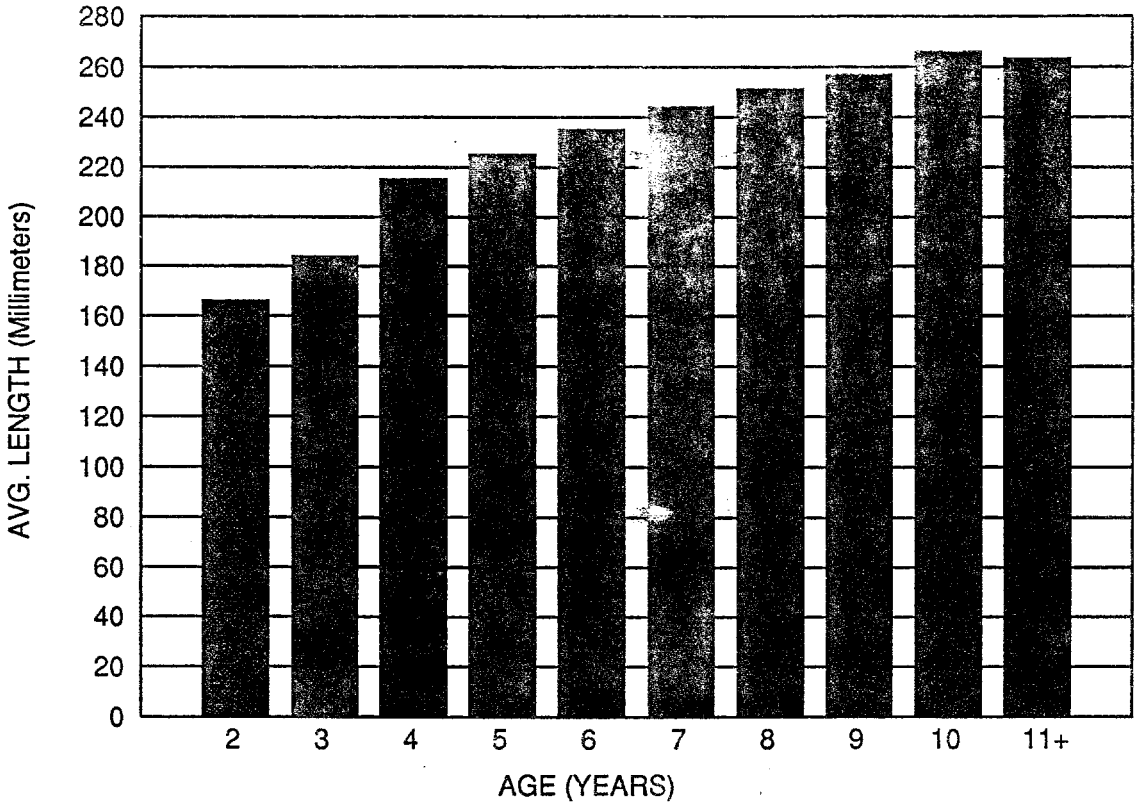

Figure 9. Comparison of average lengths of herring by age class from commercial harvests for the Kodiak Management Area, 1991.

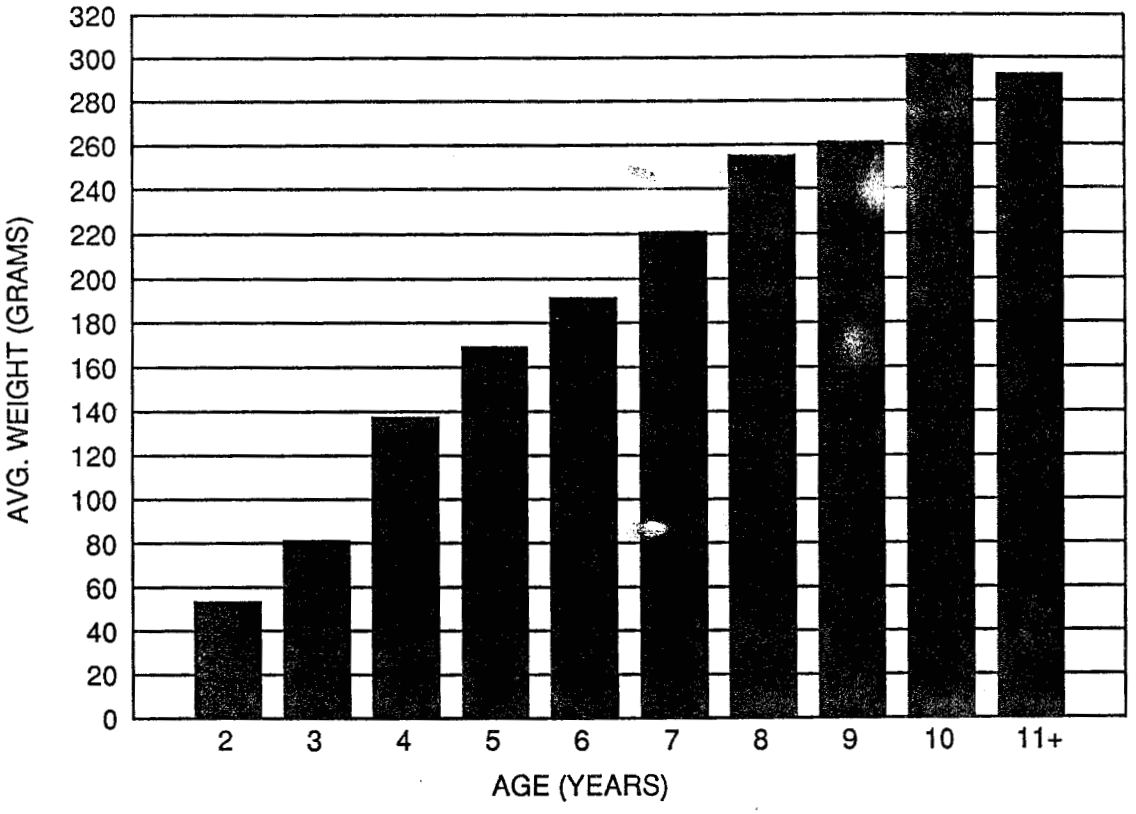

Figure 10. Comparison of average weights of herring by age class from commercial harvests for the Kodiak Management Area, 1991.

Table 6. Summary of average weights (grams) by age of herring sac-roe stocks, Kodiak Management Area, 1991.

STOCK NAME[a] MGMT. AREA	HARVEST[b] (TONS)	SAMPLE DATE	WEIGHT-AT-AGE 2	3	4	5	6	7	8	9	10	11+	TOTAL AVG.	N
Raspberry/Muskomee (Gillnet)	**116.6**	5/14	-	-	126	-	156	161	-	-	-	-	135	61
Malina	**57.6**	4/21	55	90	128	-	167	173	223	-	-	-	129	125
Paramanof	**204.5**	4/29	-	86	121	130	164	188	-	-	-	302	121	175
Foul Bay	**22.6**	4/28	-	-	138	133	188	179	217	-	-	-	169	46
Perenosa Bay	**11.6**	5/12	-	78	120	158	212	213	249	344	294	299	147	192
Viekoda Bay	**25.1**	6/16	-	73	126	139	155	208	248	254	296	313	159	75
Village Islands	**50.2**	5/12	-	81	128	151	184	209	245	191	293	262	146	105
W. Uganik Pass	**39.5**	5/11-16	-	73	125	189	160	221	254	251	256	293	139	368
N.E. Arm Uganik	**39.4**	5/26	-	72	110	-	-	-	-	-	-	275	81	141
E. Arm Uganik	**56.1**	5/20-21	46	72	127	173	192	218	247	-	274	274	128	156
S. Arm Uganik	**36.5**	5/14	-	129	168	169	-	228	221	-	-	289	217	43
Inner Uyak Bay	**161.2**	6/18	-	100	152	143	20[illegible]	247	247	300	281	259	225	77
Zachar Bay	**107.8**	5/14-23	-	86	136	169	201	210	221	-	275	284	136	283
Spiridon Bay	**136.0**	5/23		111	147	-	181	245	242	-	-	274	187	37
Deadman Bay	**180.5**	5/20-28	57	82	134	156	174	228	263	229	284	282	199	274
Sulua Bay	**93.6**	5/20-26	-	71	122	133	-	207	238	214	276	267	124	208
Outer Olga/Moser Bay	**149.3**	6/10	-	73	141	164	177	208	235	271	225	333	167	92
W. Sitkalidak	**67.1**	4/24	-	85	133	-	-	282	272	-	-	-	123	144
Barling Bay	**160.0**	4/15	-	102	143	153	241	245	293	313	302	321	166	256
E. Sitkalidak (Amee Bay)	**106.9**	4/16-23	-	95	140	202	225	254	278	266	304	323	174	358
Inner Kiliuda Bay	**14.2**	4/22	-	88	136	138	130	-	-	-	-	-	128	89
Shearwater Bay	**43.1**	4/22	-	100	137	173	-	236	242	-	-	-	132	87
Outer Ugak Bay	**50.9**	6/1	-	-	138	139	213	255	312	-	-	-	157	79

-Continued-

Table 6. (page 2 of 2)

STOCK NAME[a] MGMT. AREA	HARVEST[b] (TONS)	SAMPLE DATE	WEIGHT-AT-AGE 2	3	4	5	6	7	8	9	10	11+	TOTAL AVG.	N
Inner Ugak Bay	**91.8**	5/12	-	99	141	170	-	201	280	284	305	334	162	122
Woman's Bay	**111.1**	5/12-29	-	88	148	189	190	217	266	306	342	305	170	357
Kizhuyak Bay (Gillnet)	**104.0**	5/12	-	-	148	184	212	239	264	-	313	306	200	97
Kalsin Bay	**9.2**	5/20	-	88	137	173	-	-	-	-	-	-	125	95
Middle Bay	**15.4**	5/23-31	-	86	147	190	-	222	238	-	-	335	150	157
28 MGMT. UNITS	**2,261.8**		**52.7**	**80.7**	**136.8**	**169.5**	**190.8**	**221.0**	**254.6**	**260.8**	**301.5**	**292.1**	**152.7**	**4,239**

[a] All samples were from commercial purse seine catches collected by ADF&G personnel, except the weight samples from Raspberry Strait/Muskomee Bay and Kizhuyak Bay were from commercial gillnet catches collected by ADF&G personnel.

[b] Of the 44 stocks exploited in 1991, samples were collected from 28 (67%). These 28 stocks yielded 2,261.8 tons, or 93% of the management area's total harvest of 2,432 tons.

a large percentage of recruit age-3 herring in the population, harvests were more restrictive to the larger, more marketable, fish. Purse seine fishermen released large numbers of these age-3 herring throughout the season, in 1992 the exploitation rate can be expected to increase with the presence of more age-4 herring.

These exploitation rates should be qualified, in that surveys represent an unknown and undoubtedly highly variable proportion of the actual biomass. These exploitation rates can be used for trend evaluation, but they should not be compared to the spawning biomass indices achieved by ADF&G in Prince William Sound, Cook Inlet, and Bristol Bay. These areas have a relatively large biomass available for aerial indexing and where that portion of the observed biomass is annually less variable, i.e. there is greater opportunity for observing a greater and more consistent proportion of the actual total biomass. The exploitation rates achieved in these fisheries would be more comparable between areas.

1992 Management Plans and Issues

The 1992 management plan will be similar to those plans which have been in effect since 1982. The GHL's for the management units will be based on the stock status and ADF&G's ability to manage the fishery. Based on the age class data collected in 1991 and the increasing biomass estimates for the past three years, the preliminary GHL for 1992 is 2,700 tons. At this time a major increase in the GHL isn't prudent since the 1992 harvest is expected to target age-3 through 5 fish. Age-4 and 5-year-old herring should comprise at least 50% of the harvest. However, weights are expected to be lower than experienced prior to 1990. Age-3 recruit herring are also expected to comprise approximately 20-25% of the 1992 harvest, which could effect roe recovery percentages for the seine fleet. These age compositions, spawn observations, and fishery performances are all indicators that the Kodiak area biomass should support a stable to increasing sac roe fishery in upcoming years.

ADF&G will continue to rely greatly on industry spotter pilots, processors, and fishermen to provide fishery data to manage this fishery. Conflicts between seine and gillnet gear still occurs but for the most part, herring fishermen seem to be satisfied with the current management strategy. Budget restraints in 1992 may result in less ADF&G field crews being stationed in management units. It may be necessary for ADF&G to make changes in fishing time or enact other regulations to prevent overexploitation of the herring stocks, which may change the fishery to which the permit holders are now accustomed.

HERRING FOOD/BAIT FISHERY 1991-92

INTRODUCTION

Historical Perspective

Historically, the Kodiak "food/bait" herring fishery was one of the State's three major domestic fisheries. Southeastern Alaska and Prince William Sound were the other two major fisheries. Although the earliest recorded harvest was in 1912, Kodiak's herring fishery experienced a notable expansion during the early 1920's as industry personnel searched for new areas where large herring were available. Large herring were preferred since the initial products were utilized as food products such as salted and pickled herring. This fishery developed primarily from the response to demand for food products created by World War I. By the late 1920's the demand for herring food products had declined but demand for reduction products such as, fish meal and oil, increased. During the fishery's peak production years it was primarily a reduction fishery and yielded tonnages which dwarf current food/bait harvests, (Figure 11). During a seventeen year period (1934-1950) an average harvest of 31,600 tons was sustained, (Table 7). The primary product was fish meal and oil, which required large quantities of herring available for harvesting with secondary uses being limited amounts of salted food and bait products. Major harvest areas were located in eastern Shelikof Strait and adjacent bays and straits along the west side of Kodiak and Afognak Islands. Quotas and harvest weights were measured by barrels (where 250 lb of herring equals one barrel) until 1956, when the unit of measure was changed to short tons. Historical effort involved large, approximately 70 feet in length, "sardine seiner" type vessels used in conjunction with "holding pounds" delivering to five major reduction plants. In addition, small local seine vessels and gillnets were used for a portion of the food industry delivering to floating and small shore based salting and pickling operations.

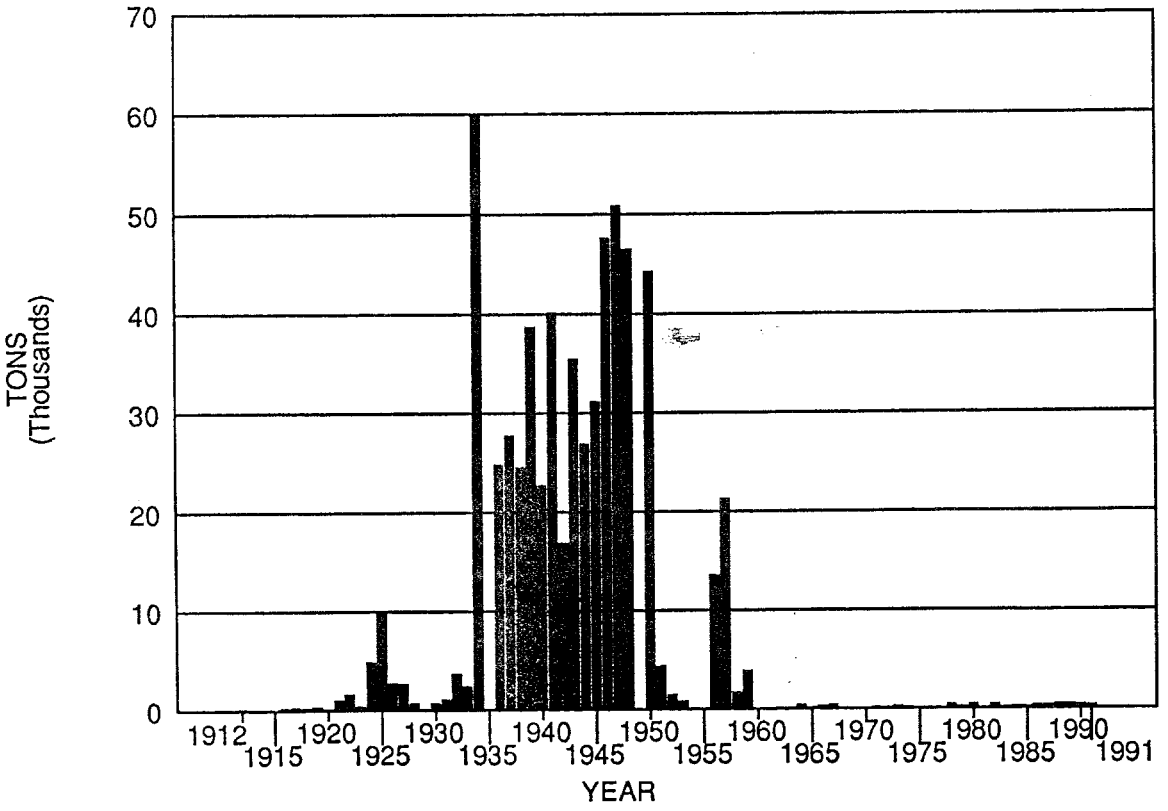

Figure 11. Historic herring food|bait harvest for the Kodiak Management Area, 1912-1991.

Table 7. Historical herring food/bait harvest for the Kodiak Management Area, 1912-1991.

YEAR	TONS	YEAR	TONS	YEAR	TONS
1912	20.0	1940	22677.0	1968	15.4
1913	0.0	1941	40083.5	1969	11.0
1914	0.0	1942	16791.0	1970	7.5
1915	0.0	1943	35352.0	1971	44.2
1916	70.0	1944	26835.0	1972	49.8
1917	137.9	1945	31114.0	1973	178.0
1918	118.4	1946	47505.9	1974	40.1
1919	259.7	1947	50743.0	1975	5.2
1920	45.9	1948	46428.0	1976	N/A
1921	944.9	1949	0.0	1977	N/A
1922	1482.6	1950	44132.5	1978	398.9
1923	321.5	1951	4299.0	1979	124.8
1924	4823.0	1952	1389.0	1980	380.7
1925	9997.0	1953	725.0	1981	18.0
1926	2680.9	1954	0.0	1982	326.0
1927	2592.9	1955	0.0	1983	33.4
1928	625.0	1956	13524.0	1984	123.0
1929	NO DATA	1957	21218.5	1985	102.0
1930	622.0	1958	1711.0	1986	213.0
1931	1000.0	1959	3831.0	1987	217.1
1932	3594.0	1960	0.0	1988	340.2
1933	2312.5	1961	0.0	1989	344.6
1934	60000.0	1962	0.0	1990	312.6
1935	NO DATA	1963	0.0	1991	215.3
1936	24748.0	1964	309.8		
1937	27659.3	1965	35.0		
1938	24522.0	1966	198.0		
1939	38600.5	1967	300.3		

From the early 1960's to 1973, there were no harvest quotas and the season was open year round. Beginning in 1974, the season dates were changed to run from 1 August through 28 February; however no regulatory Guideline Harvest Levels (GHL's) were in effect until 1979. During 1979 and 1980, the GHL was 12,600 tons for the food and bait season. As a result of the rapidly developing sac roe fishery, the GHL for the food/bait season was reduced to 1,000 tons in 1981 and remained at that level through 1987. Regulatory GHL's for the food/bait herring fishery were initially replaced with the current regulatory harvest strategy in 1988, Appendix D.1.

METHODS

Fishery Characteristics

The current herring food/bait fishery can be characterized as being a secondary commercial fishery on herring concentrations located in Kodiak waters. It is primarily a bait fishery providing a frozen product for longline and crab fishermen. Effort and harvest levels are at historical lows for the food/bait fishery, while the sac roe fishery supports relatively high levels of effort and harvest. The food/bait fishery is an open-to-entry fishery, while the sac roe fishery has been limited-to-entry since 1981. Existing regulations designate priority status to the sac roe fishery, in that regulatory harvest strategy allocates a very major percentage of the allowable harvest on local stocks to the sac roe fishery.

By regulation, the herring food/bait season extends from 1 August through 28 February. The entire Kodiak Area is open to continuous fishing on 1 August for all legal gear types, which are seines, gillnets and trawls. There are no exclusive gear areas and the only gear restrictions are for maximum purse seine length of 100 fathoms and maximum purse seine depth of 1,025 meshes and a maximum length for gillnets of 150 fathoms. All permit holders and buyers are required to register at the Kodiak ADF&G office prior to fishing or purchasing herring. At that time, management plans are

issued and catch reporting procedures and current regulations are reviewed. Each landing is sampled for age, weight, length (AWL) information and skipper interviews are conducted to evaluate which sac roe stocks are being impacted.

During the early 1980's, major concentrations of herring were located in eastern Shelikof Strait and in adjacent bays to the west side of Kodiak and Afognak Islands. The biomass found in this area exceeded that of known Kodiak spawning stocks. These herring were targeted by food/bait fishermen and questions arose concerning the origin of these fish. In 1986, a stock identification study based on scale pattern analysis was performed on herring which were harvested from a large biomass located in the east part of the Shelikof Strait (Johnson 1988). The study concluded that at least 80% of the East Shelikof herring that were sampled were of Kamishak Bay spawning stock origins, which is within the Lower Cook Inlet Management Area.

Harvest Strategy

The 1990/91 Kodiak Food/Bait Fishery Management Plan describes the current harvest strategy in detail (Appendix D.1). In March 1988, the Alaska State Board of Fisheries allocated not more than two percent of the previous season's total available spawning biomass from Kamishak to be harvested during Kodiak's food/bait herring fishery. For local Kodiak spawning stocks, which are exploited during the sac roe fishery, the food/bait GHL on those same stocks is 10% of the previous seasons sac roe harvest.

In accordance with the addendum to the 1988 Kamishak Bay Herring Management Plan, "the allocation of herring to the Shelikof Strait food/bait fishery is based on spawning biomass", primarily age-5 and older herring and not on the biomass of juveniles. The quantity of Kamishak Bay stocks age-4 and younger found in each landing will have their weights adjusted upward to reflect a harvest of age-5 herring. These younger age class food/bait

harvested herring will be treated as the age-5 herring, as spawning biomass.

Age-4 and younger herring were selected because in the Kamishak spawning stocks, herring are not considered to have attained complete recruitment into the spawning biomass until they have reached age-5.

RESULTS

1991-92 Harvest and Effort

A total of 215.3 tons of herring were harvested, of which 100 tons are considered Kamishak spawning stocks and the remaining 115.3 tons are considered local Kodiak spawning stocks. The "adjusted" harvest total (converting age-4 and younger weights to age-5 weights) from the Kamishak food/bait harvest is 112 tons.

Seventeen vessels (eight seine, nine trawl) and five buyer/processors registered to participate in this fishery. Trawl gear accounted for 90% of the season harvest at 194.4 tons. There was a harvest of 20.9 tons by purse seine gear.

The Fishery

The 1991/92 GHL for Kamishak herring stocks over wintering in Shelikof Strait was 212 tons. An additional 337 tons was available for harvesting from the remainder of the Kodiak Management Area's local spawning stocks.

Kodiak's food/bait herring season ran from 1 August through 28 February. Fishing periods were 24 hours per day and seven days a week. During the 1991-92 season the harvests occurred between mid-August through mid-October. Seven emergency orders (E.O.'s) were issued, one which established fishing periods and one which opened closed waters areas to prevent incidental harvest of salmon. The

four remaining (E.O.'s) were issued to close areas to fishing after a harvest had occurred. The Raspberry Straits Section unit was closed with a harvest of 20.9 tons of herring which was identified to be Kodiak stocks with the GHL for this unit of 11.7 tons. The Kupreanof Section was closed with a harvest of 118 tons. After initial analysis of the A-W-L data, the remainder of the Uganik Unit, (F/B 4) was closed to prevent the overharvest of local Kodiak stocks. The combined GHL's for the Uganik Unit (F/B 4) was 44.5 tons. The West Afognak Area had a harvest of 61 tons resulting in closures of that area (F/B 1), except for offshore areas in Shelikof Strait.

Herring samples were collected from each commercial harvest for age, weight and length (AWL) analysis, (Table 8). These samples are used in conjunction with harvest location and skipper interviews to assist in assigning harvests to Kodiak or Kamishak spawning stocks.

ADF&G Hydroacoustic Survey

The state research vessel R/V RESOLUTION was used to complete one hydroacoustic survey trip to assess overwintering concentrations of herring. The survey trip ran from 12-15 November 1991. During the survey minor concentrations of herring were located in the Terror Passage, Kupreanof Strait, and Raspberry Strait. Large concentrations of herring were discovered in the outer portion of Viekoda Bay along the northeastern shore of Uganik Island. The Outer Viekoda herring were collected by use of a small test trawl and were sampled for A-W-L data, (Table 9). Areas surveyed included Uganik Bays and Passages, Eastern Shelikof Strait from Uganik Bay north to Steep Cape, Viekoda Bay, Terror Bay, and Kupreanof Straits. No hydroacoustic tapes were made on this survey due to the "dispersed" schooling encountered during this trip.

Table 8. Commercial caught food/bait herring AWL summaries for the Kodiak Management Area, 1991-92.

Sample Period	Age (years)	Sex: Male	Sex: Female	Sex: Unknown	Total	Percent of Total	Weight: Mean (gm)	Weight: Std. Dev.	Weight: Number Weighed	Std. Length: Mean (mm)	Std. Length: Std. Dev.	Std. Length: Number Measured
PARAMANOF BAY STATISTICAL AREA A030												
10/18	0	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-
	2	2	5	2	9	6.4	89	14.7	9	185	8.8	9
	3	49	62	2	113	80.1	124	20.2	113	203	9.0	113
	4	-	3	-	3	2.1	158	17.9	3	221	8.5	3
	5	1	1	-	2	1.4	273	27.6	2	245	5.7	2
	6	3	1	-	4	2.8	235	11.7	4	245	5.2	4
	7	3	3	-	6	4.3	275	24.0	6	257	7.7	6
	8	1	-	-	1	.7	344	-	1	270	-	1
	9	-	-	-	-	-	-	-	-	-	-	-
	10	-	2	-	2	1.4	351	21.9	2	270	14.8	2
	+ 11	1	-	-	1	.7	319	-	1	261	-	1
Period Total		60	77	4	141	100.0	141	56.5	141	208	19.9	141
RASPBERRY STRAITS STATISTICAL AREA A010												
8/21	0	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-
	2	-	1	-	1	.9	73	-	1	174	-	1
	3	44	62	-	106	98.1	109	18.8	67	198	8.6	106
	4	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-
	6	1	-	-	1	.9	153	-	1	229	-	1
	7	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-
	+ 11	-	-	-	-	-	-	-	-	-	-	-
Period Total		45	63	-	108	100.0	19	19.7	69	198	9.3	108

-Continued-

Table 8. (page 2 of 3)

Sample Period	Age (years)	Sex: Male	Sex: Female	Sex: Unknown	Total	Percent of Total	Weight: Mean (gm)	Weight: Std. Dev.	Weight: Number Weighed	Std. Length: Mean (mm)	Std. Length: Std. Dev.	Std. Length: Number Measured
KUPREANOF STRAITS STATISTICAL AREA UG10												
	0	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-
	2	1	1	-	2	.9	82	2.8	2	181	4.9	2
	3	29	20	1	50	23.0	125	33.7	49	203	16.2	50
	4	18	12	-	30	13.8	168	24.9	30	223	10.8	30
10/15	5	11	5	-	16	7.4	234	28.0	16	246	6.9	16
	6	6	3	-	9	4.1	244	38.5	9	247	10.3	9
	7	19	12	-	31	14.3	265	42.2	31	255	11.8	31
	8	28	17	-	45	20.7	289	26.8	45	260	7.5	45
	9	1	-	-	1	.5	340	-	1	268	-	1
	10	9	4	-	13	6.0	328	32.1	13	269	6.1	13
	+ 11	12	8	-	20	9.2	335	26.2	20	268	7.0	20
Period Total		134	82	1	217	100.0	231	82.3	216	240	27.6	217
KUPREANOF STRAITS STATISTICAL AREA UG10												
	0	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-
	2	2	1	-	3	2.3	95	14.0	3	193	7.1	3
	3	14	11	-	25	19.5	139	36.1	20	210	9.8	25
	4	10	6	-	16	12.5	183	24.1	13	230	8.6	16
10/16	5	6	8	-	14	10.9	221	25.3	10	246	6.4	14
	6	7	-	-	7	5.5	215	43.7	5	241	11.6	7
	7	17	11	-	28			38.7	20	254	8.0	28
	8	9	15	-	24	18.8	295	34.1	13	262	7.1	24
	9	2	2	-	4	3.1	317	-	1	267	4.4	4
	10	-	6	-	6	4.7	327	8.6	4	275	8.0	6
	+ 11	1	-	-	1	.8	343	-	1	275	-	1
Period Total		68	60	-	128	100.0	218	71.4	90	242	23.2	128

-Continued-

Table 8. (page 3 of 3)

Sample Period	Age (years)	Sex: Male	Sex: Female	Sex: Unknown	Total	Percent of Total	Weight: Mean (gm)	Weight: Std. Dev.	Weight: Number Weighed	Std. Length: Mean (mm)	Std. Length: Std. Dev.	Std. Length: Number Measured
INNER ALITAK BAY STATISTICAL AREA AL20												
	0	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-
	3	4	3	-	7	11.9	131	12.3	7	208	7.7	7
	4	13	13	-	26	44.1	189	27.8	26	232	10.1	26
9/29	5	3	3	1	7	11.9	202	29.5	7	235	6.2	7
	6	1	1	-	2	3.4	209	.7	2	246	3.5	2
	7	9	2	-	11	18.6	264	36.4	11	253	11.1	11
	8	-	5	-	5	8.5	244	31.3	5	254	8.3	5
	9	-	-	-	-	-	-	-	-	-	-	-
	10	1	-	-	1	1.7	216	-	1	241	-	1
	+ 11	-	-	-	-	-	-	-	-	-	-	-
Period Total		31	27	1	59	100.0	204	47.9	59	236	16.4	59

Table 9. Test trawl caught herring food/bait AWL summaries for the Kodiak Management Area, 1991-92.

Sample Period	Age (years)	Sex			Total	Percent of Total	Weight			Std. Length		
		Male	Female	Unknown			Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured
OUTER VIEKODA BAY (S. OF OUTLET CAPE) STATISTICAL AREA UG21												
	0	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	1	1	.7	57	-	1	149	-	1
	2	3	-	1	4	2.7	89	20.9	4	182	10.3	4
	3	53	61	-	114	77.6	124	16.3	114	199	7.9	114
	4	5	8	-	13	8.8	163	37.4	13	216	14.5	13
11/13	5	-	-	-	-	-	-	-	-	-	-	-
	6	2	2	-	4	2.7	203	51.7	4	234	17.0	4
	7	-	4	-	4	2.7	227	32.6	4	240	8.5	4
	8	3	1	-	4	2.7	315	12.9	4	258	7.7	4
	9	1	2	-	3	2.0	239	93.0	3	239	27.6	3
	10	-	-	-	-	-	-	-	-	-	-	-
	+ 11	-	-	-	-	-	-	-	-	-	-	-
Period Total		67	78	2	147	100.0	138	47.5	147	204	17.7	147

1992-93 Management Plans and Issues

Additional ADF&G surveys and sampling needs to be completed in order to continue to document overwintering herring concentrations. This is especially important since Kodiak's local spawning population is increasing, which is complicating stock assignments (local vs. Kamishak) of harvested herring. An additional management concern is the lack of funding to provide for on the grounds monitoring of the fishery in the event there is an increase in effort levels. No changes in the harvest strategy are expected to occur for the 1992-93 season.

HERRING SUBSISTENCE/PERSONAL USE FISHERY

The Fishery

The subsistence and personal use fishery for herring is regulated only during the sac roe herring fishery season, 15 April through 30 June. During this time period, a permit is required for individuals to harvest herring who are not sac roe commercial fishermen. Sac roe commercial fishermen may retain herring from their lawfully taken commercial catch to fulfill their subsistence or personal use needs. The majority of the harvest of herring during this time period is for individual bait purposes in longline fisheries. The conditions of this permit can be seen in Appendix E.1.

1991 Harvest and Effort

A total of 50 permits were issued in 1991, with nine permits returned which had a harvest. The total harvest was 6,600 pounds with 3,490 pounds from the General District, 1,000 pounds from the Uganik District, and 2,110 pounds from the Afognak District.

LITERATURE CITED

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Johnson, B.A. and C. Burkey, and D. Gaudet. (Draft manuscript 1988). Stock identification of Pacific herring in the bait fishery in Shelikof Strait, Alaska, 1985/86. Alaska Department of Fish and Game, Division of Commercial Fisheries. Juneau.

1991

KODIAK MANAGEMENT AREA
HERRING SAC-ROE HARVEST STRATEGY

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Regional Information Report[1] No. 4K91-8

Alaska Department of Fish and Game
Division of Commercial Fisheries
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[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

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ABSTRACT

This document is intended to provide commercial fishermen and buyers with the pertinent management information and guidelines that are required to be adhered to when participating in the Kodiak commercial sac-roe fishery.

The 1991 Kodiak herring sac-roe fishery guideline harvest level is 2,510 tons. The season for this fishery will begin at 12:00 noon on April 15 and will close at 12:00 noon on June 30. Fishing periods will be 24 hours in duration starting at 12:00 noon on odd numbered days and ending at 12:00 noon on even numbered days.

The Kodiak sac-roe fishery is currently managed by the use of 57 management units; herring within these units are treated as individual stocks and have a history of sac-roe harvests. Additionally there are 14 exploratory management units which potentially support sac-roe stocks and 6 management units which occur offshore and are not perceived to have habitat suitable for spawning activity to occur.

Guideline Harvest Levels (G.H.L.) are provided for each of the 57 management units as shown in Table 1 on page 9. In-season emergency order closures for each unit will occur as the G.H.L.'s for each unit are achieved. Closures may also result prior to attaining a G.H.L. if the fishery performance indicates that stock status is weaker than expected.

All in-season emergency order closures or reopenings will be broadcast on 4125 Khz by Peggy Dyson following her daily marine weather broadcasts at 8:00 a.m. and 6:00 p.m. News releases will be available both inside and outside the Kodiak ADF&G building. Additionally, the most current closure announcements will be available 24 hours/day on the ADF&G record-a-phone at 486-4559.

All herring buyers/processors and all tenders are required to register at the Kodiak ADF&G office prior to commencing operations in the Kodiak Area. There is no special vessel registration required for fishing vessels.

1991
KODIAK AREA HERRING SAC-ROE FISHERY

INTRODUCTION

The Kodiak Area herring sac-roe fishery has occurred annually since 1964, a 27 year period. This fishery was an open-to-entry fishery from 1964 to 1980, and was under a moratorium-to-new-entry fishery from 1981 to 1984, and has been a limited entry fishery from 1985 to present. Effort levels since 1979 are shown in Table 2 on page 13. A listing of entry permits issued by gear type as of February 1991 is shown in Table 3 on page 14.

This fishery targets on individual herring stocks during their spawning period. The desired product is pre-spawn herring having a roe recovery percentage acceptable to industry. In recent years the average roe recovery has approximated 10%.

From 1964 through 1990 the average harvest has approximated 1,350 tons. For the twelve (12) year period from 1979-1990, when both seine and gillnet gear levels have evolved through similar regulatory adjustments, the average harvest is estimated at 2,073 tons. The annual harvest levels during this twelve year period have oscillated closely to this average harvest (Table 2, page 13).

GENERAL HARVEST POLICY

This commercial fishery is intended to occur in an orderly fashion, with minimal waste of the resource and within conservation limits as determined by the Alaska Department of Fish and Game (ADF&G). Consequently, ADF&G will manage the fishery per the statewide general herring guideline harvest policy which provides for harvesting to occur in traditional in-shore areas, at the traditional time of greatest roe recovery value, and not to exceed 10-20% total harvest of the available spawning biomass. However, roe recovery will not be a criteria for emergency openings or closures except in cases where documented excessive wastage is, or is expected to be, a factor.

Because of the differential timing and abundance of Kodiak's various exploited herring stocks, relatively high ratio of gear levels to Guideline Harvest Levels (GHL's), and the competition between gear types for the same stocks, this fishery is best served by a fixed opening date, which is currently April 15. The season will close for each stock by emergency order as their respective guideline harvest levels are achieved or when fishery performance and stock performance indicate that deviations from the guideline harvest levels are warranted, i.e. where actual harvests occur at levels greater or lesser than expected. Stocks which are considered to be under-exploited in-season will remain open for adequate exploitation to occur or until the

regulatory closure of June 30. During the regulatory season, April 15 to June 30, stocks which have been closed to harvesting may be reopened if it is determined by ADF&G that "new" fish have increased the available spawning biomass to the point that the initial exploitation rate has dropped below 10% for that stock (See Table 1.) Any reopenings will require confirmation that the "new" fish are not juvenile herring, post spawners, or other forage fish and will require that ADF&G have the ability to monitor and regulate the reopening "on the grounds". At least 24 hours notice will be given prior to any reopenings.

REGULATORY ABSTRACT

REGULATIONS IN EFFECT:

There are no new regulations for the 1991 season.

REGISTRATION REQUIREMENTS:

Tenders and Processors

The tender registration procedure requires:

- Each tender operator and processor must register with the Kodiak ADF&G office either in person or may be registered by an authorized agent for that tender or processor.

- Registration must occur prior to taking fish on-board the tender or taking fish at the processing plant.

Registration will ensure that all tenders and processors know the proper reporting requirements needed by ADF&G to manage the herring sac-roe fishery.

THIS REGULATION WILL BE STRICTLY ENFORCED FOR THE 1991 SEASON!

- (See Regulation 5 AAC 27.540 of the Commercial Herring Regulations.

Fishing Vessels

There are no special registration requirements for either seine or gillnet vessels.

GUIDELINE HARVEST LEVELS:

For the 1991 sac-roe season, approximately 2,510 short tons are expected to be harvested from the entire management area. Harvest projections by management unit are listed in Table 1.

These harvest projections are the best estimates of desired harvest levels for each stock based upon ADF&G evaluation of stock status. These harvest projections are not guaranteed quotas and the actual harvest may exceed or fall short of these projections.

In-season evaluation of each stocks actual status will be guided by several criteria associated with stock performance, e.g. biomass estimates, age composition, etc! and with fishery performance, e.g. fishery timing and harvest duration, etc!

FISHING SEASON

April 15 through June 30 unless closed earlier by emergency order on a stock by stock basis.

Closures may result when desired harvest levels of each stock are either achieved or in jeopardy of being significantly exceeded. Closures may also result when unexpected weaknesses in stock strength become apparent.

FISHING PERIODS

Initially, fishing periods will be 24 hours long. They will begin at 12:00 Noon on all odd numbered days and end at 12:00 Noon on all even numbered days. The first 24 hour fishing period will begin at 12:00 Noon on April 15.

CLOSED AREAS:

Regulatory Closures

Browns Lagoon is closed at the seaward entrance of the lagoon.

Women's Bay is closed inside of a line from Shannon's Point to Nyman's Peninsula. The latitudes and longitudes of these points are described in regulation 5 AAC 27.530 (page 36 of the 1990/91 Commercial Herring Regulation Booklet).

1991 Emergency Order Closures:

All Uganik Island Lagoons will remain closed until it can be determined that specific and adequate spawning biomasses are available for harvest.

EXTRA TIME FOR GILLNETTERS

Under certain conditions, herring gillnetters are allowed a two hour grace period before having to completely remove their gear from the water. These conditions are:

1. Herring gillnets may remain in the water up to two hours after the "primary closure time" for those fishing periods having fishing time of three hours or less.

2. Herring gillnets may remain in the water up to two hours after the announced "primary" closure time for those fishing periods greater than three hours in length, where the announcement occurs less than three hours before the scheduled "primary closure time" of the fishing period.

The "primary closure time" is the time at which all seine gear must have completed fishing. When it applies, the "secondary closure time", i.e. at the end of the two hour grace period for gillnet gear, ALL GILLNETS MUST BE COMPLETELY OUT OF THE WATER AND NO GILLNET GEAR MAY BE SET OR RESET AFTER THE "PRIMARY CLOSING TIME".

AIRPLANES:

There are no restrictions on the use of airplanes in the roe herring fishery.

SIZE LIMITS:

No CFEC herring seine permit holder may sell or have aboard a vessel any herring that were taken during the herring sac-roe season if the number of individual herring per 50 lbs. of net weight exceeds 250 fish.

In an attempt to prevent waste, permit holders are encouraged to check with their markets prior to fishing to find out minimum size/weight restrictions and roe percentages which are acceptable.

IN-SEASON STRATEGY

General Discussion

As shown in Table 1, those sections where historical harvests have occurred, have been assigned guideline harvest levels. Those sections where sporadic or no harvests have occurred, have been designated "Exploratory" with no designated guideline harvest level, however in-season

closures will be used to ensure that excessive harvests are minimized in exploratory situations.

The guideline harvest levels established for each section, district and/or the entire management area are meant to reflect the stock status. This means that the previous season's stock performance has been evaluated and that trends have been identified and used to establish the current season's GHL's. Specifically, these criteria are 1) 1990 expected biomass vs. actual biomass estimates, 2) average school size, 3) trends in age composition, 4) level of recruitment (age 3), 5) proportion of the spawning population age 5 and younger, 6) level of age 2 fish in the spawning biomass (indicator of future recruit strength) and 7) spawn observations (extent, frequency, amount deposited). This information is supplemented by fishery performance information, namely the expected vs. actual harvest timing, harvest duration, and harvest level.

Guideline harvest level adjustments are subsequently made based upon the aforementioned criteria. Adjustments may vary from 0 to ± 100% of the previous season's GHL depending upon the degree remedial action which is required, generally adjustments are gradual, ± 25% or ± 50%.

At any time in-season, closed area adjustments can be made when it appears that pre-season expectations were incorrect. Consequently there may be sections either closed prior to reaching their GHL's or allowed to harvest in excess of their GHL's either in one opening or reopenings if the assessed available spawning biomass warrants it.

Fishing Periods

Initially, fishing periods will begin at 12:00 Noon on the odd numbered days of the month beginning on April 15 and end at 12:00 Noon on the even numbered days. Staggered days of fishing have the advantage of providing clearly defined closed periods which allow the staff time to collect, summarize, and update all harvest data from previous fishing periods; it allows for comparisons between reported and actual harvests. Since 1979, the occurrence of significant excessive harvests in this fishery have been prevented by providing pre-established fishing periods. Towards the end of the season (usually early June) when fleet size and exploited stocks are few in number, fishing periods may be modified to provide more continuous fishing time to facilitate adequately harvesting late occurring stocks. However, ADF&G's ability to monitor this fishery becomes very limited by late May and June, and this will be a major consideration in the nature of fishing period modifications.

For the 1991 sac-roe fishery, more restrictive adjustments in fishing periods are not expected to occur. However, in the event that active gear levels expand or become unexpectedly efficient to the point that a pattern of excessive harvests develop, deviations from the normal 24 hour fishing periods may be required.

E.O. Announcements: "Getting the Word"

Because the management strategy allows for all gear types to fish all open areas during the open fishing periods, there is considerable dispersion of gear throughout the management area. Consequently, it is very important for the fleet to keep abreast of any changes in closures, potential short notice closures, and/or reopenings. This can be accomplished in the following ways: 1) By personal contact with the Kodiak Herring Management staff in Kodiak via office visits, telephone (either at work or at home), or radio-telephone; 2) By contact with ADF&G field personnel and the ADF&G vessel, the M/V COHO; 3) By contacting Peggy Dyson on 4125 mhz or any local herring processor and having them transmit the latest Kodiak herring emergency order; 4) By calling the 24-hour recorded message phone at 486-4559; 5) By listening for any emergency order update which will be broadcast by Peggy Dyson following either her 8:00 A.M. or 6:00 P.M. weather broadcasts; 6) By reading or collecting the latest emergency order from the pouch posted outside the entrance to the Kodiak Fish and Game building; and 7) By listening to the Fish and Game reports broadcast over the local AM and FM radio stations (consult stations for broadcast times). No announcements will be given via VHF because of the limited broadcast range from the Kodiak office; however special consideration may be given to the Chiniak Bay fishery if the VHF base station is operational for the 1991 season.

In-season closure announcements for management units which are not monitored by an ADF&G field crew normally occur at the end of a fishing period. However, short notice in-period closures may occur in management units not monitored by ADF&G field crews. Closures of this type will be announced by ADF&G management staff monitoring the area by aircraft or initially announced on 4125 mhz following the weather broadcasts at 8:00 A.M. or 6:00 P.M. daily.

Because of the extensive announcements associated with this fishery, it is highly recommended that fishermen document the latest E.O. announcement broadcast from Peggy Dyson by either marking a chart or making a tape recording of her broadcast. Many fishermen currently do this as do the ADF&G and F&W protection vessels.

ADF&G Field Crews/Fishermen Cooperation:

The crew on board the Department's M/V COHO and seasonal biologists in remote tent camps will aid the Area Management Biologists by making frequent fishermen contacts in order to collect data on harvest levels and rates, fleet movements, and fleet observations of herring concentrations. Fishermen cooperation will be appreciated when Department personnel request herring samples from the commercial catch; also, samples from juvenile schools inadvertently seined-up will be gladly accepted by all ADF&G personnel. These samples will be used primarily for monitoring age composition, when used with other stock performance indicators, assists in determining the health of the stock. Copies of historical age data by stock are readily available at the Kodiak ADF&G office.

ADF&G field crews will also be monitoring and mapping spawning activities, and will be soliciting information on commercial sightings to supplement information gathered by ADF&G. Fishermen and spotter pilots are encouraged to provide biomass and spawning information to ADF&G; these reports will be treated confidentially. Past cooperation has generally been excellent and has proven valuable in evaluating stock status and in gaining critical management information.

In-Season Catch Reporting

With approximately 100+ limited entry permit holders expected to fish during the 1991 sac-roe season, frequent aerial surveys and timely catch reports will continue to be an important management tool, particularly in areas that are not covered by field crews. Timely and accurate catch information provided by the processors and fishermen will be essential in managing the fishery. Processors and independent tender operators will be required to provide daily tallies of herring deliveries by statistical area and must provide accurate estimates of herring onboard tenders that have not yet delivered to the cannery. Inaccurate or untimely information could result in the closure of an area. Individual code sheets will be provided for each tender or processor that is required to report catches on a daily basis by radio. Each tender operator and buyer must register with the Department prior to fishing and will be given a packet containing regulations, statistical charts, etc.

Guideline Harvest Level

The 1991 sac-roe harvest should be one of the largest on record, approximately 2,510 tons are expected to be harvested. If recruitment is above average in several major stocks or if virgin stocks are exploited, the actual harvest may well exceed the GHL. However, if recruitment is generally weak area-wide and/or adverse weather conditions prevail throughout the season the actual harvest may be significantly less than the GHL.

The listing in Table 1, "GUIDELINE HARVEST LEVELS BY MANAGEMENT UNIT" will be used as an aid in making in-season management decisions. These harvest levels are meant to reflect the status of each listed stock, however, some stocks lack the data base needed for adequate evaluation. Consequently, annual harvest levels for these stocks may fluctuate considerably until their status is better understood. Again, all fishermen, pilots and processors are encouraged to provide the ADF&G management staff with any information or estimates on stock size they may accumulate either in-season or post-season.

TABLE 1
KODIAK HERRING SAC ROE FISHERY
KODIAK GUIDELINE HARVEST LEVELS BY STOCK

Page 1 of 4

STAT. AREA	MGMT. UNITS	1991 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS @10% EXPLOITATION	@20% EXPLOITATION
	AFOGNAK DIST.			
A010	Raspberry Sts.	110 TONS	1,100 Tons	550 Tons
A020	Malina Bay	30 TONS	300 Tons	150 Tons
A031	Paramanof Bay	40 TONS	400 Tons	200 Tons
A032	Foul Bay	20 TONS	200 Tons	100 Tons
A040	Devils Inlet	10 TONS	100 Tons	50 Tons
A040	Blue Fox	10 TONS	100 Tons	50 Tons
A050	Offshore W. Afog.1/	-	1/	1/
A060	Shuyak Is.	20 TONS	200 Tons	100 Tons
A070	Perenosa Bay	15 TONS	150 Tons	75 Tons
A071	Delphin Bay	10 TONS	100 Tons	50 Tons
A072	Seal Bay	10 TONS	100 Tons	50 Tons
A080	Tonki Bay	15 TONS	150 Tons	75 Tons
A090	Izhut Bay	25 TONS	250 Tons	125 Tons
A091	Kitoi Bay	15 TONS	150 Tons	75 Tons
A092	MacDonalds Lagoon	10 TONS	100 Tons	50 Tons
A100	Danger Bay	20 TONS	200 Tons	100 Tons
A101	Litnik	10 TONS	100 Tons	50 Tons
A102	Duck Bay	10 TONS	100 Tons	50 Tons
District Totals	17	380 TONS	3,800 Tons	1,900 Tons

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Continued

Table 1. Page 2 of 4

STAT. AREA	MGMT. UNITS	1991 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS @10% EXPLOITATION	@20% EXPLOITATION
	UGANIK DIST.			
UG10	Kupreanof	10 TONS	100 Tons	50 Tons
UG20	Viekoda	20 TONS	200 Tons	100 Tons
UG21	Terror	60 TONS	600 Tons	300 Tons
UG21	Uganik Is. Lagoon[2]	CLOSED	[2]	[2]
UG30	Village Island	35 TONS	350 Tons	175 Tons
UG31	W. Uganik Pass	20 TONS	200 Tons	100 Tons
UG32	NE Arm Uganik	75 TONS	750 Tons	375 Tons
UG33	E. Arm Uganik	40 TONS	400 Tons	200 Tons
UG34	S. Arm Uganik	40 TONS	400 Tons	200 Tons
UG40	Offshore Uganik[1]	-	[1]	[1]
District Totals	8	300 TONS	3,000 Tons	1,500 Tons
	UYAK DISTRICT			
UY10	Offshore Uyak[1]	-	[1]	[1]
UY20	Harvester Island	10 TONS	100 Tons	50 Tons
UY30	Inner Uyak	240 TONS	2,400 Tons	1,200 Tons
UY32	Browns Lagoon	20 TONS	200 Tons	100 Tons
UY31	Larsen Bay	10 TONS	100 Tons	50 Tons
UY40	Zachar Bay	100 TONS	1,000 Tons	500 Tons
UY50	Spiridon Bay	160 TONS	1,600 Tons	800 Tons
District Totals	6	540 TONS	5,400 Tons	2,700 Tons
	ALITAK DIST.			
AL10	Outer Alitak	(Exploration)	[3]	[3]
AL20	Inner Alitak	(Exploration)	[3]	[3]
AL21	Deadman Bay	155 TONS	1,550 Tons	775 Tons
AL30	Sulua/Portage Bay	75 TONS	750 Tons	375 Tons
AL40	Lower Olga/Moser[4]	15 TONS	150 Tons	75 Tons
AL40	No. Upper Olga B.[4]	10 TONS	100 Tons	50 Tons
AL50	So. Upper Olga B.[4]	190 TONS	1,900 Tons	950 Tons
AL60	Geese/Twoheaded	(Exploration)	[3]	[3]
District Totals:	5	445 TONS	4,450 Tons	2,225 Tons

Continued

Table 1. Page 3 of 4

STAT. AREA	MGMT. UNITS	1991 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS @10% EXPLOITATION	@20% EXPLOITATION
	STURGEON/HALIBUT DIST.			
SH10	Sturgeon/Halibut	(Exploration)	3/	3/
	GENERAL DISTRICT			
GO10	Kaiugnak	10 TONS	100 Tons	50 Tons
GO20	W. Sitkalidak St.	65 TONS	650 Tons	325 Tons
GO21	Barling	20 TONS	200 Tons	100 Tons
GO22	E. Sitkalidak St.	95 TONS	950 Tons	475 Tons
GO23	Tanginak Anchorage	15 TONS	150 Tons	75 Tons
GO30	Outer Sitkalidak	(Exploration)	3/	3/
GO40	Outer Kiliuda	(Exploration)	3/	3/
GO41	Inner Kiliuda	10 TONS	100 Tons	50 Tons
GO42	Shearwater	25 TONS	250 Tons	125 Tons
GO50	Pasagshak	25 TONS	250 Tons	125 Tons
GO50	Outer Ugak	(Exploration)	3/	3/
GO51	Inner Ugak	50 TONS	500 Tons	250 Tons
GO60	Womens Bay	110 TONS	1,100 Tons	550 Tons
GO70	Monashka/Mill B.	(Exploration)	3/	3/
GO80	Anton Larsen	15 TONS	150 Tons	75 Tons
GO81	Sheratin	10 TONS	100 Tons	50 Tons
GO90	Kizhuyak	110 TONS	1,100 Tons	550 Tons
G100	Kalsin Bay	15 TONS	150 Tons	75 Tons
G101	Middle Bay	20 TONS	200 Tons	100 Tons
G102	Inshore Chiniak	10 TONS	100 Tons	50 Tons
G103	Spruce Island	10 TONS	100 Tons	50 Tons
District Total 17		615 TONS	6,150 Tons	3,075 Tons
	MAINLAND DIST.			
M010	North Mainland	(Exploration)	3/	3/
M020	Inner Kukak	50 TONS	500 Tons	250 Tons
M030	Outer Kukak1/	-	1/	1/
M040	Inner Missak	(Exploration)	3/	3/
MO40	Outer Missak1/	-	1/	1/
M050	Inner Katmai	50 TONS	500 Tons	250 Tons

Continued

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Table 1. Page 4 of 4

STAT. AREA	MGMT. UNITS	1991 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS @10% EXPLOITATION	@20% EXPLOITATION
	MAINLAND DISTRICT (Continued)			
M060	Outer Katmai[1/]	-	[1/]	[1/]
M070	Alinchak	30 TONS	300 Tons	150 Tons
M080	Puale Bay	(Exploration)	[3/]	[3/]
M090	Portage Bay	(Exploration)	[3/]	[3/]
M100	Outer Portage[1/]	-	[1/]	[1/]
M110	Wide Bay	100 TONS	1,000 Tons	500 Tons
M120	Lower Shelikof	(Exploration)	[3/]	[3/]
District Total	4	230 TONS	2,300 Tons	1,150 Tons
GRAND TOTAL	57	2,510 TONS	25,100 Tons	12,550 Tons

[1/]These are offshore management units which are not expected to yield herring of sac-roe quality. These units are more applicable to the food/bait fishery. (See Herring Food/Bait Fishery Management Plan.)

[2/]The Uganik Lagoon Unit refers to all lagoons on Uganik Island. Spawning biomasses associated with these lagoons appear to have been reduced to less than 50 tons, thus all waters of the lagoons located on Uganik Island will remain closed to commercial herring fishing effective at 12:00 Noon April 15, 1991.

[3/]Adequate biomass to justify an "exploratory" harvest; the actual harvest should not exceed 20% of the available biomass.

[4/]The following management units have been modified either in name or boundaries for the purpose of in-season management of the Olga/Moser Bay herring stocks. Each unit will be described by emergency order when closures are issued for these units.

- AL40 Lower Olga/Moser Unit: Formerly that portion of the Olga/Moser Bay Section south of the latitude of Stockholm Point.
- AL50 North Upper Olga Unit: Formerly that portion of the Olga/Moser Bay Section north of the latitude of Stockholm Point.
- AL50 South Upper Olga Unit: Formerly called the Upper Olga Bay Section.

TABLE 2.
KODIAK AREA MANAGEMENT
HERRING SAC-ROE FISHERY INDUSTRY SUMMARY 1979 - 1990

YEAR	GEAR TYPE	UNITS OF GEAR	NUMBER LANDINGS	EST. HARVEST (TONS)	EST. HARVEST PERCENT	EST. TOTAL VALUE	EST. AVERAGE EARNINGS	AVERAGE TONS/BOAT	AVERAGE TONS/LNDG	AVERAGE LNDG/BOA
	PURSE SEINE	57	-	1457.2	84	$2,185,788	$38,347	25.6	-	-
1979	GILLNET	125	-	277.9	16	$416,670	$3,333	2.2	-	-
	TOTAL	182	-	1735.1	100	$2,602,458			-	-
	PURSE SEINE	92	-	2009.0	84	$1,377,987	$14,978	21.8	-	-
1980	GILLNET	109	-	374.0	16	$280,423	$3,573	3.4	-	-
	TOTAL	201	-	2383.0	100	$1,658,410			-	-
	PURSE SEINE	79	207	1596.2	77	$1,137,764	$14,402	20.2	7.7	2.6
1981	GILLNET	114	406	469.2	23	$395,640	$3,471	4.1	1.2	3.6
	TOTAL	193	613	2065.4	100	$1,633,404				
	PURSE SEINE	45	138	1447.0	82	$801,840	$17,819	32.2	10.5	3.1
1982	GILLNET	67	191	323.6	18	$182,160	$2,719	4.8	1.7	1.8
	TOTAL	112	329	1770.6	100	$1,533,404				
	PURSE SEINE	41	164	1796.9	78	$1,437,520	$35,061	43.8	11	4
1983	GILLNET	64	284	521.6	22	$417,280	$6,520	8.2	1.8	4.4
	TOTAL	105	448	2318.5	100	$1,854,800				
	PURSE SEINE	39	138	1691.2	78	$1,352,960	$34,691	43.3	12.3	3.5
1984	GILLNET	69	212	471.5	22	$377,200	$5,467	6.8	2.2	3.1
	TOTAL	108	350	2162.7	100	$1,730,160				
	PURSE SEINE	34	118	1244.2	63	$1,119,780	$32,935	36.6	10.5	3.5
1985	GILLNET	81	348	723.5	37	$651,150	$8,039	8.9	2.1	4.3
	TOTAL	115	466	1967.7	100	$1,770,930				
	PURSE SEINE	31	132	1110.8	71	$1,054,310	$34,010	35.8	8.4	4.3
1986	GILLNET	71	385	448.6	29	$426,170	$6,002	6.3	1.2	5.4
	TOTAL	102	517	1559.4	100	$1,480,480				
	PURSE SEINE	29	122	1591.3	74	$1,591,300	$54,872	54.9	13	4.2
1987	GILLNET	62	411	554.6	26	$554,600	$8,945	9	1.35	6.6
	TOTAL	91	533	2145.9	100	$2,145,900				
	PURSE SEINE	33	169	1303.6	60	$1,694,550	$51,350	39.5	7.7	5.1
1988	GILLNET	76	555	867.2	40	$1,127,620	$14,837	11.4	1.6	7.3
	TOTAL	109	724	2170.8	100	$2,822,170				
	PURSE SEINE	37	171	1512.6	67	$1,285,710	$34,749	40.9	8.8	4.6
1989	GILLNET	83	627	736.0	33	$625,600	$7,537	8.9	1.2	7.6
	TOTAL	120	798	2248.6	100	$1,911,310				
	PURSE SEINE	27	156	1644.0	70	$1,397,400	$51,755	60.9	10.5	5.8
1990	GILLNET	63	544	703.0	30	$597,550	$9,485	11.2	1.3	8.6
	TOTAL	90	700	2347.0	100	$1,994,950				

TABLE 3.
STATUS OF KODIAK SAC ROE HERRING PERMITS

	1987	1988	1989	1990
G.N. TRANSFERABLE	59	63	64	72
G.N. NON-TRANSFERABLE	48	41	41	31
G.N. TOTAL	107	104	105	103
G.N. FISHED	62	76	83	63
SEINE TRANSFERABLE	40	45	45	46
SEINE NON-TRANSFERABLE	26	24	24	25
SEINE TOTAL	66	69	69	71
SEINE FISHED	29	33	37	27
TOTALS				
TRANSFERABLE	99	108	109	118
NON-TRANSFERABLE	74	65	65	56
TOTAL	173	173	174	174
FISHED	91	109	120	90

ACE 9264850

Table 4.

1991

HERRING SAC-ROE SEASON

ALASKA DEPARTMENT OF FISH AND GAME

KODIAK AREA MANAGEMENT STAFF

Area Management Biologist	Asst. Area Management Biologist
Dave Prokopowich	Kevin Brennan

Fishery Biologist

Joan Brodie

M/V Coho Crew	Herring Field Crew Personnel		Aircraft Pilots
Tom Emerson	Kim Rudge	Ed Sampson	Hal Terry
Dennis Gretsch	Mo Lambdin	Jon Becker	Larry Nicholson
	Shawna Rudio	Bruce McIntosh	
	Ed Hajdys	Sue Tuccio	
	Dave Sarafin	Bruce Wetterlin	

REGIONAL SUPERVISOR: Larry Nicholson

REGIONAL FINFISH COORDINATOR: Pete Probasco

Appendix A.1. (page 19 of 23)

1990 ALASKA STATEWIDE HERRING HARVESTS AND PRELIMINARY 1991 HARVEST PROJECTIONS[1/]

Page 1 of 2	1990 ACTUAL		1991 PROJECTED				
Fishery	Opening or First Harvest	Harvest (s. tons)	Harvest (s. tons)	Expl. Rate	Mean Wt.(g)	Spawning Biomass (s. tons)	Stock Status/Trend
Southeastern							
Kah Shakes	.....No Fishery.....		679	21%		3,300	Depressed/Stable
Sitka	4/05	3,804	3,200	14%		22,695	Moderate/Declining
Seymour Canal	4/28	359	0			2,850	Depressed/Declining
Lynn Canal	.....No Fishery.....		0			Unknown	Depressed/Stable
Hoonah Snd. Pound	4/14	12	11[a]	6%		2,350	High/Stable
Food and Bait	1/01	3,843	2,814	15%		18,350	Moderate/Stable
Prince William Sound							
Seine	4/12	8,302	11,300				
Gillnet	4/13	505	660				
Pound Kelp	4/11	101	221[a]				
Wild Kelp	4/21	119	195[a]				
Food/Bait	11/01	1,800	3,170[b]				
Total			19,448[c]	20%	155	96,800	High/Stable
Lower Cook Inlet							
Eastern & Outer Districts	.....No Fishery.....						
Southern Dist.	.....No Fishery.....		200	3%	160	6,214	Moderate/Increasing
Kamishak Dist.	4/22	2,264	1,553	10%[e]	214	17,256	Moderate/Declining
Upper Cook Inlet							
Sac-Roe	4/22	72	100			Unknown	Depressed/Increasing
Food and Bait	4/30	55	100			Unknown	Depressed/Increasing
Kodiak							
Sac-Roe	4/15	2,347	2,500			Unknown	Moderate/Increasing
Food and Bait							
Eastern Shelikof	8/01	189	173				
Other Kodiak	8/01	124	250			Unknown	Moderate/Stable
Chignik Sac-Roe	.....No Fishery.....		65			Unknown	
Alaska Peninsula							
Port Moller	5/30	273	300	15%		2,000	Depressed/Stable
South Peninsula	5/14	312	450			Unknown	Moderate/Stable
Dutch Harbor							
Food and Bait	8/15	820	662				
Bristol Bay (Togiak)							
Seine	5/09	9,245	6,594				
Gill Net	5/08	3,062	2,198				
Spawn on Kelp	5/11	206[a]	175[a]				
Total		14,627[f]	10,954[f]	20%		54,772	Depressed/Declining
Kuskokwim Area							
Security Cove	5/12	234	224	15%		1,490	Moderate/Declining
Goodnews Bay	5/18	455	221	15%		1,472	Moderate/Declining
Cape Avinof	5/29	50	256	15%		1,708	Moderate/Declining
Nunivak Island	.....No Fishery.....		[g]			235	Depressed/Declining
Nelson Island	.....No Harvest.....		[g]			1,897	Depressed/Declining
Cape Romanzof	5/23	329	447	15%		2,983	Depressed/Declining
Norton Sound							
Gillnet	5/28	6,032	4,368				
Beach Seine	5/28	347	508				
Total		6,379	5,075	20%		23,371	High/Stable
Port Clarence	.....No Harvest.....		165			Unknown	
Sac Roe Harvest Total[h]		37,992	36,188				
Food and Bait Harvest Total:		6,831	7,168	Total Unknown			
Total Herring Harvest:		44,823	43,356	Biomass		261,743	

Footnotes on next page

Table 5. Page 2 of 2

[a]Havest of spawn-on-kelp product in short tons.

[b]Preliminary 1990 food/bait guideline. The 1991 guideline will be set after 1991 sac-roe season.

[c]Includes mortality allowances of 2,750 and 1,550 tons for pound and wild spawn on kelp fisheries.

[e]Kamishak District exploitation rate includes the eastern Shelikof food and bait harvests.

[f]Togiak total harvest includes an allowance for 1,500 tons mortality for the spawn-on-kelp fishery.

[g]Projected biomass below minimum for commercial harvest; fishery will be opened if threshold biomass observed.

[h]Sac-roe statewide total harvests do not include allowances for spawn-on-kelp fishery mortality.

1/Table compiled on January 22, 1991, harvest estimates are preliminary and are subject to change.

TABLE 6.
KODIAK MANAGEMENT AREA
COMMERCIAL HERRING FISHERIES HISTORICAL HARVEST LEVELS
(SHORT TONS)

YEAR	FOOD & BAIT	SAC ROE	TOTAL	YEAR	FOOD & BAIT	SAC ROE	TOTAL
1912	20.0	0.0	20.0	1953	725.0	0.0	725.0
1913	0.0	0.0	0.0	1954	0.0	0.0	0.0
1914	0.0	0.0	0.0	1955	0.0	0.0	0.0
1915	0.0	0.0	0.0	1956	13524.0	0.0	13524.0
1916	70.0	0.0	70.0	1957	21218.5	0.0	21218.5
1917	137.9	0.0	137.9	1958	1711.0	0.0	1711.0
1918	118.4	0.0	118.4	1959	3831.0	0.0	3831.0
1919	259.7	0.0	259.7	1960	0.0	0.0	0.0
1920	45.9	0.0	45.9	1961	0.0	0.0	0.0
1921	944.9	0.0	944.9	1962	0.0	0.0	0.0
1922	1482.6	0.0	1482.6	1963	0.0	0.0	0.0
1923	321.5	0.0	321.5	1964	309.8	568.0	877.8
1924	4823.0	0.0	4823.0	1965	35.0	657.0	692.0
1925	9997.0	0.0	9997.0	1966	198.0	2769.0	2967.0
1926	2680.9	0.0	2680.9	1967	300.3	1662.0	1962.3
1927	2592.9	0.0	2592.9	1968	15.4	2001.0	2016.4
1928	625.0	0.0	625.0	1969	11.0	1130.0	1141.0
1929	NO DATA	0.0	0.0	1970	7.5	342.0	349.5
1930	622.0	0.0	622.0	1971	44.2	284.0	328.2
1931	1000.0	0.0	1000.0	1972	49.8	215.0	264.8
1932	3594.0	0.0	3594.0	1973	178.0	831.0	1009.0
1933	2312.5	0.0	2312.5	1974	40.1	868.0	908.1
1934	60000.0	0.0	60000.0	1975	5.2	8.0	13.2
1935	NO DATA	0.0	0.0	1976	N/A	5.0	5.0
1936	24748.0	0.0	24748.0	1977	N/A	338.0	338.0
1937	27659.3	0.0	27659.3	1978	398.9	904.0	1302.9
1938	24522.0	0.0	24522.0	1979	124.8	1736.0	1860.8
1939	38600.5	0.0	38600.5	1980	380.7	2384.0	2764.7
1940	22677.0	0.0	22677.0	1981	18.0	2063.0	2081.0
1941	40083.5	0.0	40083.5	1982	326.0	1771.0	2097.0
1942	16791.0	0.0	16791.0	1983	33.4	2319.0	2352.4
1943	35352.0	0.0	35352.0	1984	123.0	2163.0	2286.0
1944	26835.0	0.0	26835.0	1985	102.0	1968.0	2070.0
1945	31114.0	0.0	31114.0	1986	213.0	1558.0	1771.0
1946	47505.9	0.0	47505.9	1987	217.1	2146.0	2363.1
1947	50743.0	0.0	50743.0	1988	340.2	2171.0	2551.2
1948	46428.0	0.0	46428.0	1989	315.8	2248.6	2564.4
1949	0.0	0.0	0.0	1990	312.6	2347.0	2659.6
1950	44132.5	0.0	44132.5				
1951	4299.0	0.0	4299.0				
1952	1389.0	0.0	1389.0				

ACE 9264854

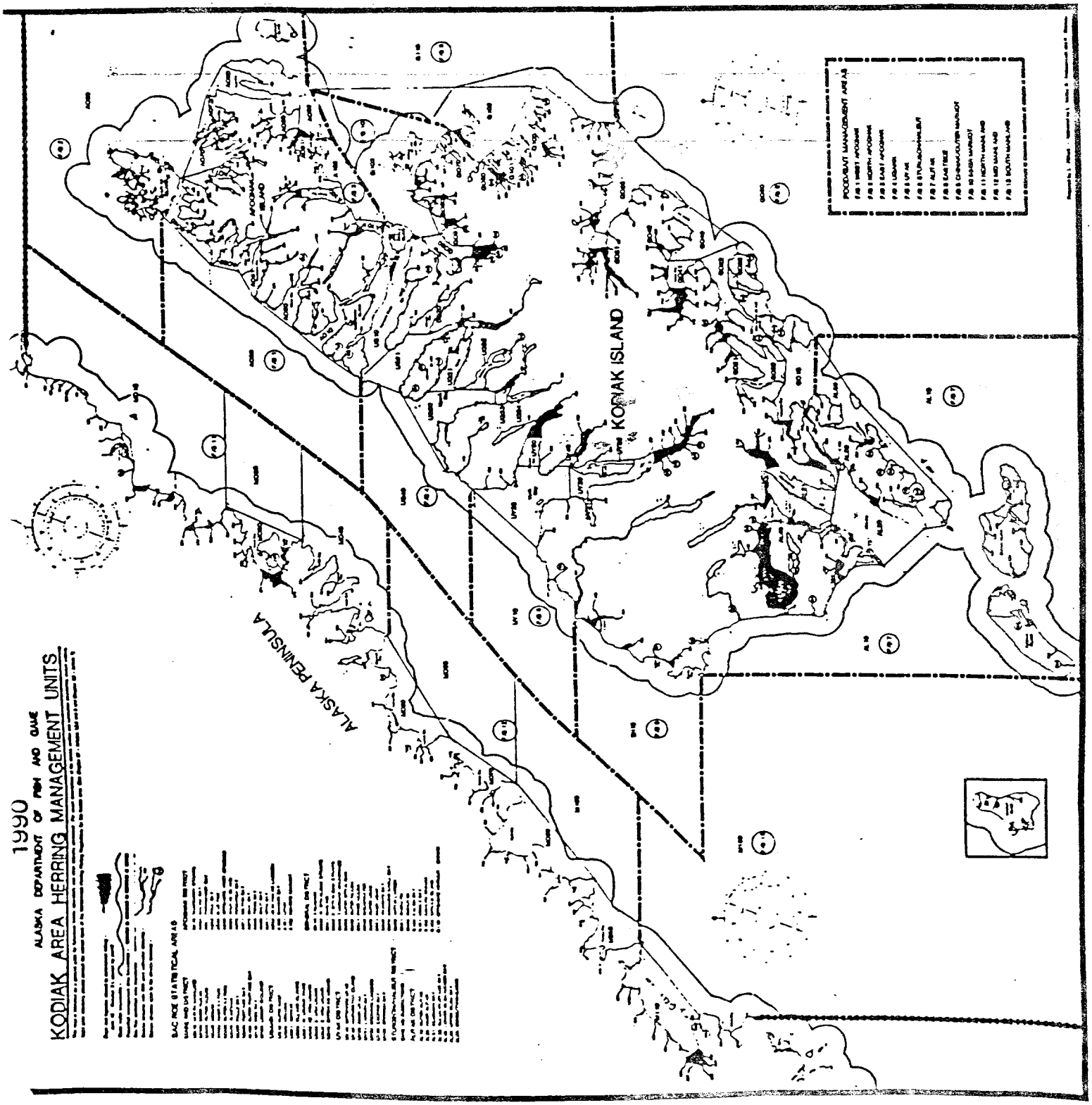
TABLE 7.

KODIAK MANAGEMENT AREA

HERRING SAC-ROE FISHERY HISTORICAL HARVEST AND EFFORT LEVELS

YEAR	TONS HARVESTED	SEINE	GILLNET	NUMBER CO.S	NUMBER OF VESSELS SEINE	GILLNET	TOTAL
1964	567.8	567.8		2	5		5
1965	657.2	657.2		2	8		8
1966	2,769.3	2,769.3		4	11		11
1967	1,662.4	1,662.4		4	5		5
1968	2,000.6	2,000.6		4	10		10
1969	1,130.0	1,130.0		9	21		21
1970	341.6	341.6		5	13		13
1971	284.3	284.3		2	4		4
1972	215l0	215.0		1	4		4
1973	831.0	831.0		4	11		11
1974	868.0	868.0		4	26		26
1975	8.0	8.0		3	2		2
1976	4.6	4.6		1	1		1
1977	338.4	338.4		3	11		11
1978	903.6	880.6	23.0	7	28	7	35
1979	1,735.1	1,457.2	277.9	8	57	125	182
1980	2,383.0	2,009.0	374.0	9	92	109	201
1981	2,065.4	1,596.2	469.2	9	79	114	193
1982	1,770.6	1,447.0	323.6	6	45	67	112
1983	2,318.5	1,796.9	521.6	7	41	64	105
1984	2,162.7	1,691.2	471.5	7	39	69	108
1985	1,967.7	1,244.2	723.5	7	34	81	115
1986	1,558.4	1,110.8	447.6	8	31	71	102
1987	2,145.9	1,591.3	554.6	8	29	62	91
1988	2,171.0	1,303.5	867.5	6	33	76	109
1989	2,248.6	1,512.6	736.0	6	37	83	120
1990	2,347.0	1,644.0	703.0	6	27	63	90
TOTALS	**37,455.7**	**30,962.7**	**6,493.0**				
AVERAGE	**1,347.2**	**1,146.8**	**499.5**				

FIGURE 1.



ACE 92648564/4/C/HF

Appendix B.1. Summary of emergency order abstracts issued for the herring sac roe fishery, Kodiak Management Area, 1991.

Emergency Order #4-F-K-01-91
Effective Date: April 15, 1991

EXPLANATION:

This emergency order establishes fishing periods for the 1991 Kodiak Area commercial herring sac-roe fishery, describes the initial fishing period, and clarifies waters closed to commercial herring fishing.

The fishery will open for 24 hour fishing periods, each of which begins at 12:00 Noon on the odd numbered days of the month and closes at 12:00 Noon on the even numbered days of the month. Each 24 hour opening will be separated by a 24 hour closure in the entire management area except for the following areas which will remained closed to commercial herring fishing until further notice:

(1) Brown's Lagoon

(2) Women's Bay inside of a line from Shannon's Point to the southern tip of Nyman's Peninsula

(3) All lagoons on Uganik Island

The only exception to this "24 hour on - 24 hour off" rule is the period from 12:00 Noon May 31 through 12:00 Noon June 2 when the fishery shall actually be open for a 48 hour period due to the occurrence of two consecutive odd numbered days.

JUSTIFICATION:

Regulations adopted by the Board of Fisheries established that fishing periods for the commercial sac roe fishery in the Kodiak Area would be announced by Emergency Order. During the sac roe season, April 15 through June 30, the small herring stocks of the Kodiak Area are concentrated and so vulnerable to over exploitation. The 24 hour opening separated by 24 hour closures will reduce the time that individual stocks are subject to exploitation and will assist the Department by allowing time to collect harvest information and assess the situations in the various management units.

This Emergency Order is necessary to establish the initial and in-season fishing periods for the commercial herring sac-roe fishery and to clarify which waters are closed to commercial herring fishing for the entire season.

Emergency Order #4-f-K-02-91
Effective Date: April 15, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Barling Bay Subsection (GO21) effective at 10:00 P.M Monday April 15, 1991 until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-4) states that the guideline harvest for the Barling Bay Subsection of the General District (GO21) is 20 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently a closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-03-91
Effective Date: April 21, 1991

EXPLANATION:

This emergency order closes the Malina Bay Section (A020) to commercial herring fishing effective at 10:30 P.M. Sunday April 21, 1991 until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest for the Malina Bay Section of the Afognak District (AO20) is 30 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently a closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-04-91
Effective Date: April 22, 1991

EXPLANATION:

This emergency order closes the Shearwater Subsection (Unit G042) and the Inner Kiliuda Subsection (Unit G041) to commercial herring fishing effective at 12:00 Noon Monday April 22, 1991 until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest for the Shearwater Subsection (G042) is 30 tons and for the Inner Kiliuda Subsection (G041) is 10 tons. Preliminary catch information indicates catches

are at or over the guideline harvest level. Consequently a closure of these entire management units are warranted to prevent over exploitation.

Emergency Order #4-F-K-05-91
Effective Date: April 23, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the East Sitkalidak Subsection (G022) of the General District effective at 8:30 P.M. Tuesday April 23, 1991 until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest for the East Sitkalidak Subsection (G022) of the General District is 95 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently a closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order 4-F-K-06-91
Effective Date: April 28, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Foul Bay Subsection (A032) of the Afognak District effective at 12:00 Noon Sunday April 28, 1991 until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Foul Bay Subsection (A032) is 20 tons. Preliminary catch information indicates the catch in this management unit is at or over the guideline harvest level. Consequently a closure of this management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-07-91
Effective Date: April 29, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Paramanof Bay Subsection (A031) effective at 6:45 P.M. Monday April 29, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Paramanof Bay Subsection (A031) is 40 tons. Preliminary catch information indicates that the harvest in this management unit is at or over the guideline harvest level. Consequently a closure of this management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-08-91
Effective Date: April 30, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing that portion of the West Sitkalidak Subsection (G020) west of 153°19'30" effective at 12:00 Noon Tuesday April 30, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the West Sitkalidak Subsection (G020) is 65 tons. Preliminary catch information indicates that harvests have occurred in non-traditional areas. Approximately 38 tons have been harvested from bays located at the west end of this Subsection, while traditionally the catch has predominately come from Sitkalidak Straits, towards the east end of the Subsection. It is felt the harvests in these bays represent new, exploratory fisheries and to prevent over exploitation of these developing stocks a closure of that portion of the West Sitkalidak Subsection west of 153°19'30" W. long. is warranted. The remainder of the West Sitkalidak Subsection will remain open to retain traditional harvest opportunities.

Emergency Order #4-F-K-09-91
Effective Date: May 12, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Village Islands Subsection (UG30) of the Uganik Bay District effective at 12:00 Noon Sunday May 12, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest levels for the Village Islands Subsection (UG30) of the Uganik Bay District is 35 tons. Preliminary catch information indicates the catch in this management unit is at or over the guideline harvest level.

Consequently closure of this management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-10-91
Effective Date: May 12, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Inner Ugak Subsection (G051) of the General District effective at 12:00 Noon Sunday May 12, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Inner Ugak Subsection (G051) of the General District is 50 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-11-91
Effective Date: May 14, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Raspberry Straits Section (A010) of the Afognak District effective at 12:00 Noon Tuesday May 14, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Raspberry Straits Section (A010) of the Afognak District is 110 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-12-91
Effective Date: May 16, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the West Uganik Pass Subsection (UG31) of the Uganik Bay District effective at 10:30 A.M. Thursday May 16, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the West Uganik Pass Subsection (UG31) of the Uganik Bay District is 20 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-13-91
Effective Date: May 18, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Perenosa Bay Subsection (A070) of the Afognak District effective at 12:00 Noon Saturday May 18, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Perenosa Bay Subsection (A070) of the Afognak District is 15 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-14-91
Effective Date: May 22, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the East Arm Uganik Subsection (UG33) of the Uganik Bay District effective at 12:00 Noon Wednesday May 22, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the East Arm Uganik Subsection (UG33) of the Uganik Bay District is 40 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-15-91
Effective Date: May 26, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Sulua-Portage Bay Section (AL30) of the Alitak Bay District effective at 12:00 Noon Sunday May 26, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Sulua-Portage Bay Section (AL30) of the Alitak Bay District is 75 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-16-91
Effective Date: May 28, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Deadman Bay Subsection (AL21) of the Alitak Bay District effective at 9:30 A.M. Tuesday May 28, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Deadman Bay Subsection (AL21) of the Alitak Bay District is 155 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-17-91
Effective Date: May 30, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Inner Alitak Bay Subsection (AL20) of the Alitak Bay District effective at 12:00 Noon Thursday May 30, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the Inner Alitak Bay Subsection (AL20) of the Alitak Bay District has no set guideline harvest level, but is open for exploratory harvest. Preliminary catch and biomass information indicates the catch is at or over the 20% maximum exploitation

rate. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-19-91
Effective Date: June 1, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Kizhuyak Bay Section (G090) of the General District effective at 6:00 P.M. Saturday June 1, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Kizhuyak Bay Section (G090) of the General District is 110 tons. Preliminary catch information indicates that at the time of the closure the catch will be at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-20-91
Effective Date: June 2, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing that portion of the Outer Ugak Subsection (G050) of the General District west of 152° 35' W. long. effective at 12:00 Noon Sunday June 2, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the Outer Ugak Subsection (G050) of the General District has no set guideline harvest level, but is open for exploratory harvest. Preliminary catch information indicates that harvests have occurred in non-traditional areas of this subsection. Herring have been harvested in bays at the west end of the subsection, while traditionally the catch has come from Pasagshak Bay, at the east end of the subsection. To prevent over exploitation of developing stocks a closure of that portion of the Outer Ugak Subsection west of 152° 35' W. longitude is warranted.

The remainder of the Outer Ugak Subsection will remain open to retain traditional harvest opportunities.

Emergency Order #4-F-K-21-91
Effective Date: June 4, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Zachar Bay Section (UY40) of the Uyak District effective at 9:05 A.M. Tuesday June 4, 1991, until further notice. Further, this emergency order closes to commercial herring fishing the Browns Lagoon Subsection (UY32) of the Uyak District effective at 12:00 Noon Tuesday June 4, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Zachar Bay Section (UY40) of the Uyak District is 100 tons, and for the Browns Lagoon Subsection (UY32) of the Uyak District is 20 tons. Preliminary catch information indicates the catch in the Zachar Bay Section is at or over the guideline harvest level, and that at the time of the period closure the catch in the Browns Lagoon Subsection will be at or over the guideline harvest level. Consequently closure of both of these entire management units is warranted to prevent over exploitation.

Emergency Order #4-F-K-24-91
Effective Date: June 11, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Lower Olga/Moser Bay Section (AL40) of the Alitak District effective at 9:00 P.M. Tuesday June 11, 1991, until further notice.

Further, in this emergency order closed waters are adjusted to allow herring fishing in those inner bay areas which normally close June 12 to protect salmon migrating to their natal streams.

JUSTIFICATION:

Run timing during the 1991 commercial sac roe herring fishery has been protracted and somewhat later than average. Harvestable quantities of ripe, older age class herring are just now beginning to show in many bays. Therefore, to allow sufficient opportunities for the harvest of surplus biomass, waters in the inner bays and at stream mouths which normally close June 12 to protect salmon build up areas, will remain open through June 30, if the guideline harvest level for the management unit has not been taken.

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Lower Olga/Moser Bay Section (AL40) of the Alitak District is 15 tons. Preliminary catch information indicates the catch is at or near the

guideline harvest level. Also there is increasing concern for the sockeye salmon stocks which are currently building in Olga Bay. Consequently closure of this entire management unit is warranted to prevent over exploitation of the herring stocks and to protect salmon migrating to their natal streams.

Emergency Order #4-F-K-27-91
Effective Date: June 14, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the South Arm Uganik Subsection (UG34) of the Uganik Bay District effective at 12:00 Noon Friday June 14, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the South Arm Uganik Subsection (UG34) of the Uganik Bay District is 40 tons. Preliminary catch information indicates the catch is at or near the guideline harvest level. Consequently closure of this entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-28-91
Effective Date: June 16, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Viekoda Bay Subsection (UG20) of the Uganik Bay District effective at 12:00 Noon Friday June 14, 1991, until further notice.

JUSTIFICATION:

The 1991 Kodiak Area Herring Sac-Roe Harvest Strategy (R.I.R. #4K91-8) states that the guideline harvest level for the Viekoda Bay Subsection (UG20) of the Uganik Bay District is 20 tons. Preliminary catch information indicates the catch is at or near the guideline harvest level. Consequently closure of this entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-33-91
Effective Date: July 1, 1991

EXPLANATION:

This emergency order establishes an extension in the fishing season for the 1991 Kodiak Area commercial herring sac-roe fishery, and describes the fishing periods which are being added.

The fishery will remain open through July 6, 1991, for 24 hour fishing periods, each of which begins at 12:00 Noon on the odd numbered days of the month and closes at 12:00 Noon on the even numbered days of the month. Each 24 hour opening will be separated by a 24 hour closure in the entire management area.

Those management units which have closed to commercial herring fishing by emergency order during the 1991 season will remain closed during the extended season.

JUSTIFICATION:

Regulations adopted by the Board of Fisheries established that fishing periods for the commercial sac roe herring fishery in the Kodiak Area would be announced by Emergency Order. Further, the sac roe season was scheduled to begin April 15 and to end June 30.

In 1991 the timing and composition of herring stocks migrating into the spawning areas of the many small bays of the Kodiak Area was far different than in past years. The initial concentrations of herring in many bays were mixed age groups with a high proportion of small, younger age, unmarketable, herring. As a result, the harvest guidelines were not met in many management units even though the estimated biomass' were often in excess of pre-season projections. As of June 28 only twenty four (24) of seventy four (74) management units had closed because the harvest was at or above the guideline harvest level. As the June 30 regulatory season end approached the older age, larger herring became more accessible to the commercial fishery. Many fishermen and several buyers/processors expressed interest in extending the sac roe herring season to allow for the guideline harvest levels to be taken. The herring which have been taken in recent fisheries are good quality, large fish with high roe percentages, and no biological reason exists to limit the taking of harvestable surplus. To date no conflict with early salmon buildups in the inner bays has occurred and none is anticipated. To harvest surplus herring an extension of the 1991 sac roe herring season is warranted.

To maintain an orderly fishery fishing periods will remain similar to those originally mandated. The 24 hour openings separated by 24 hour closures will reduce the time that individual stocks are subject to exploitation and will assist the Department by allowing time to collect harvest information and assess the situations in the various management units.

Emergency Order 4-F-K-53-91
Effective Date: August 19, 1991

EXPLANATION:

This emergency order establishes fishing periods for the 1991 Kodiak Area commercial herring food/bait fishery, and clarifies waters closed to commercial herring fishing.

The fishery began, by regulation, at 12:01 A.M. on August 1, 1991. Fishing periods will be continuous, 24 hour per day seven days per week, beginning at 6:00 P.M. August 19, 1991 through 12:00 Midnight February 28, 1991. Specific area closures will occur by emergency order as Guideline Harvest Levels are achieved (as determined by regulation 5 AAC 27.535.(a) and (b)).

All closed waters are as described in the 1991 Commercial Herring Fishing Regulation book.

JUSTIFICATION:

Regulations adopted by the Board of Fisheries established that fishing periods for the commercial food/bait herring fishery in the Kodiak Area would be announced by Emergency Order. During the food/bait season, August 1 through February 28, the small herring stocks of the Kodiak Area are present inside and outside the bays of the area. Also present along the west side of Kodiak and Afognak Island may be the herring stocks of Kamishak Bay, of the Lower Cook Inlet Area. The Board of Fisheries has adopted a regulatory harvest strategy, 5 AAC 27.535., to insure that an overharvest of herring stocks does not occur. This harvest strategy provides for a harvest of Kodiak spawning stocks at a level not to exceed 10 % of the previous spring's sac roe harvest, and a harvest of Kamishak herring stocks not to exceed 2% of the pre-sac roe season total biomass. As identified in the 1991/92 Harvest Strategy for the Kodiak Management Area Commercial Food/Bait Herring Fishery, R.I.R. #4K91-19, to aid in determination of harvest levels and stock identification the Department requires all herring fishermen and processors to register, to report each harvest as it occurs, and to provide the department with samples of each harvest. The first registrations occurred August 15, and so this Emergency Order is necessary to establish fishing periods. Anticipated low effort levels is the main reason for the continuous fishing period and this may be reduced at times during the season if fishing effort becomes greater than expected.

Emergency Order #4-F-K-55-91
Effective Date: August 26, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Raspberry Straits Section (Statistical Area #A010) of the West

Afognak Food/Bait Unit (F/B #1) effective at 7:00 P.M. Monday August 26, 1991, until further notice.

This emergency order does not supersede E.O. #4-F-K-53-91.

JUSTIFICATION:

Initial analysis of the herring harvested from Raspberry Straits on August 21 indicate that it is likely that Kodiak spawning stocks comprised a significant proportion of this landing. The 1991/92 Kodiak Area Food/Bait Herring Harvest Strategy (R.I.R. #4K91-19) states that the guideline harvest level for the Raspberry Straits Section of the West Afognak Food/Bait Unit is 11.7 tons.

Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-62-91
Effective Date: September 18, 1991

EXPLANATION:

This emergency order reduces closed waters to allow commercial food/bait herring fishing inside the inner bays of the Kodiak Area, effective at 12:01 A.M. Wednesday September 18, 1991 through February 28, 1992.

This emergency order does not supersede E.O. #4-F-K-53-91 or E.O. #4-F-K-55-91.

JUSTIFICATION:

In accordance with regulation 5 AAC 27.530.(a) the closed water sanctuaries for salmon which are described in 5 AAC 18.350. and 5 AAC 39.290. are also closed to herring fishing during the period June 12 through October 31. This regulation was established to offer some protection to local Kodiak salmon stocks which may be holding in the inner bays during that period. At this time it is felt that the majority of the local salmon stocks have migrated upstream, and the likelihood of any conflicts arising is minimal. Further, more small vessels have registered for commercial food/bait herring fishing this season than in the past, and the present closed water boundaries significantly reduces the protected waters in which they can fish. Therefore to provide the maximum opportunity to harvest available food/bait herring the closed water areas will be abolished.

Emergency Order #4-F-K-63-91
Effective Date: October 16, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Kupreanof Section (Statistical Area #UG10) of the Uganik Food/Bait Unit (F/B #4) effective at 7:00 P.M. Wednesday October 16, 1991, until further notice.

This emergency order does not supersede E.O. #4-F-K-53-91, E.O. #4-F-K-55-91, or E.O. #4-F-K-62-91.

JUSTIFICATION:

Initial analysis of the estimated 45 tons of herring harvested from Kupreanof Straits on October 15 indicate that Kamishak spawning stocks comprised a significant proportion of this landing. Although the pre-season food/bait guideline harvest level of 212 tons for Kamishak spawning stocks over-wintering in Shelikof Straits has not been reached at this time, a closure of the Kupreanof Straits Section is warranted in order to protect local Kodiak spawning stocks which may also over-winter in Kupreanof Straits.

Emergency Order #4-F-K-64-91
Effective Date: October 17, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing, effective at 7:00 P.M. Wednesday October 16, 1991, until further notice, the following sections of the Uganik Food/Bait Unit (F/B #4):

- The Viekoda Section (#UG20)
- The Terror Section (#UG21)
- The Village Islands Section (#UG30)
- The West Uganik Passage Section (#UG31)
- The Northeast Arm Uganik Section (#UG32)
- The West Arm Uganik Section (#UG33)
- The South Arm Uganik Section (#UG34)

This emergency order does not supersede E.O. #4-F-K-53-91, E.O. #4-F-K-55-91, E.O. #4-F-K-62-91, or E.O. #4-F-K-63-91.

JUSTIFICATION:

Prior to the closure of the Kupreanof Section (#UG10) at 7:00 P.M. October 16 approximately 80 additional tons of food/bait herring were harvested, bringing the cumulative harvest for that section to approximately 122.1 tons. Further analysis of the herring harvested indicates that both Kamishak and Kodiak spawning stocks

are present in significant proportions. It is felt that Kodiak stocks from bays adjacent to Kupreanof Straits are likely mixed in this biomass and that the potential for overharvest of the small spawning stocks of the Uganik Food/Bait Unit (F/B #4) exists. Therefore, a closure of the inner sections of the Uganik Unit is warranted in order to protect these local Kodiak spawning stocks. The Outer Uganik Section (#UG40) will remain open to allow for potential harvest of Kamishak herring.

Emergency Order #4-F-K-65-91
Effective Date: October 19, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing the Paramanof Bay Subsection (Statistical Area #A031) of the West Afognak Food/Bait Unit (F/B #1) effective at 12:00 Noon Saturday October 19, 1991, until further notice.

This emergency order does not supersede E.O. #4-F-K-53-91, E.O. #4-F-K-55-91, or E.O. #4-F-K-62-91 through E.O. #4-F-K-64-91.

JUSTIFICATION:

Initial analysis of the herring harvested from Paramanof Bay on October 18 indicate that it is likely that Kodiak spawning stocks comprised a significant proportion of this landing. The 1991/92 Kodiak Area Food/Bait Herring Harvest Strategy (R.I.R. #4K91-19) states that the guideline harvest level for the Paramanof Bay Subsection of the West Afognak Food/Bait Unit is 20.5 tons. Preliminary catch information indicates the catch is at or over the guideline harvest level. Consequently closure of the entire management unit is warranted to prevent over exploitation.

Emergency Order #4-F-K-66-91
Effective Date: October 20, 1991

EXPLANATION:

This emergency order closes to commercial herring fishing, effective at 12:00 Noon Monday October 20, 1991, until further notice, the following sections of the West Afognak Food/Bait Unit (F/B #1):

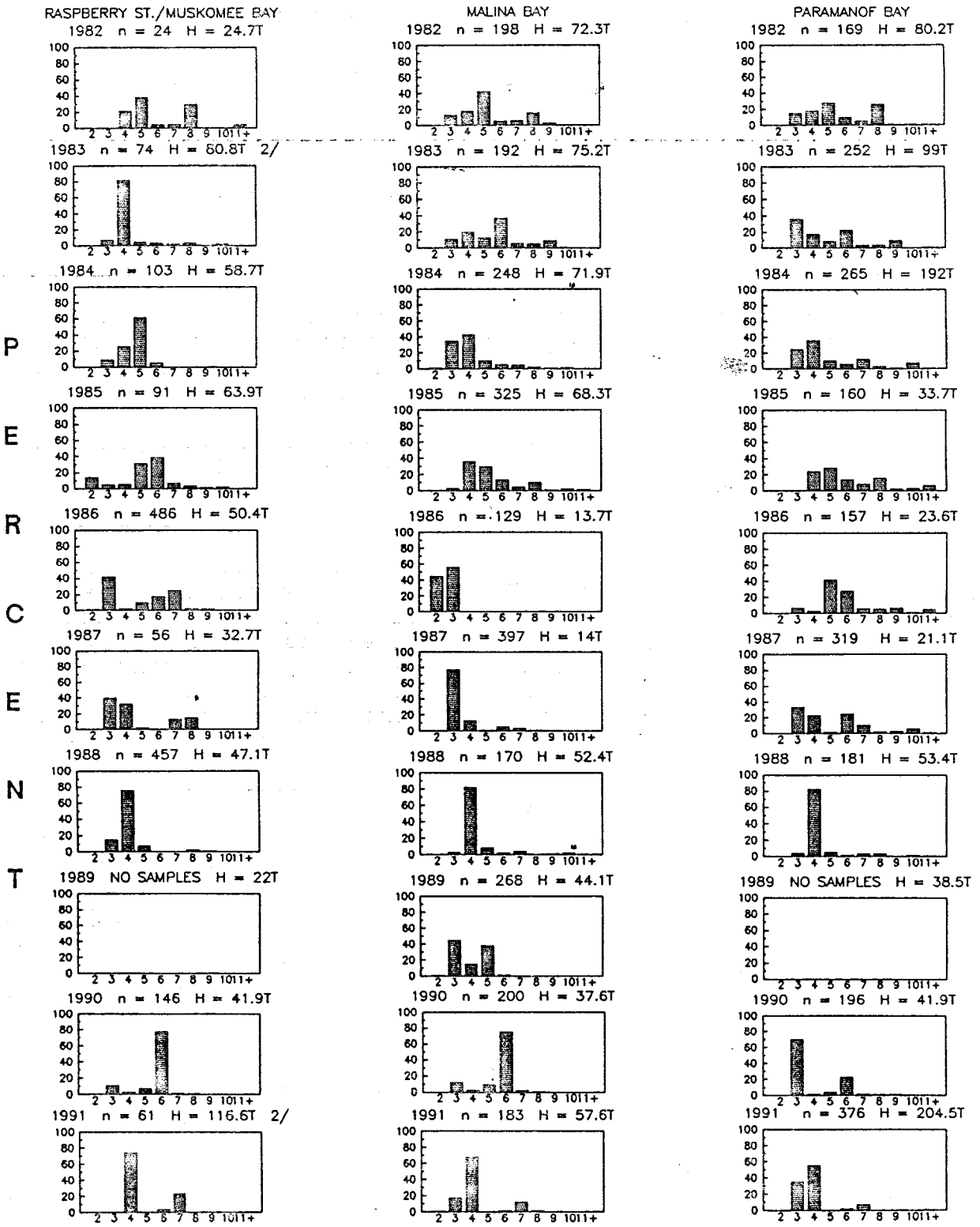
- The Malina Bay Section (#A020)
- The Foul Bay Subsection (#A032)
- The Blue Fox Section (#A040)

This emergency order does not supersede E.O. #4-F-K-53-91, E.O. #4-F-K-55-91, or E.O. #4-F-K-62-91 through E.O. #4-F-K-65-91.

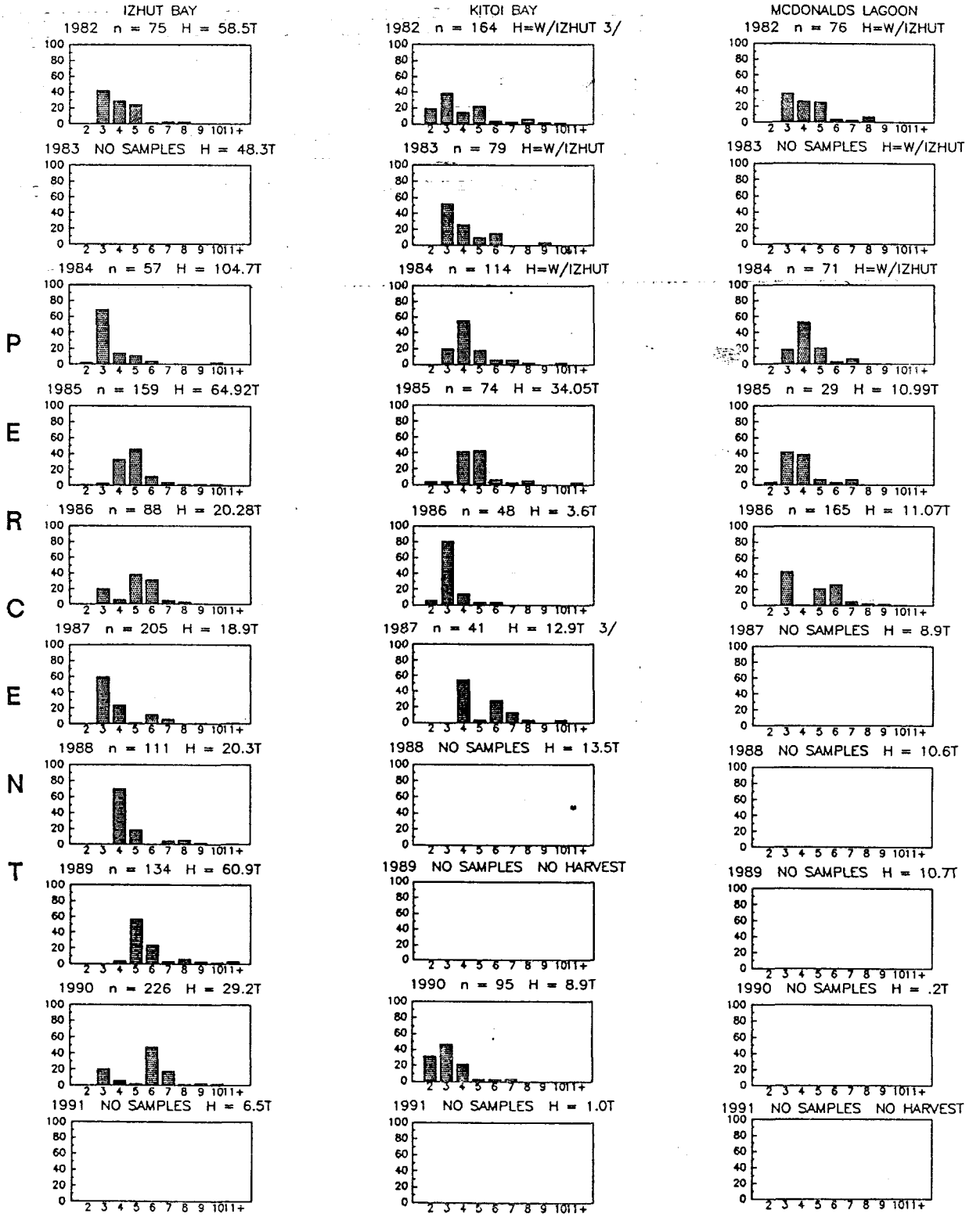
JUSTIFICATION:

Further analysis of the herring harvested from the Paramanof Bay Subsection on October 18 indicates that Kodiak spawning stocks are present in significant proportions. It is felt that Kodiak stocks from bays adjacent to Paramanof Bay are likely mixed in this biomass and that the potential for overharvest of the small spawning stocks of the West Afognak Food/Bait Unit (F/B #1) exists. Preliminary catch information indicates that the catch is at or over the guideline harvest level for the entire West Afognak Unit. Therefore, a closure of the inner sections of the West Afognak Unit is warranted in order to protect these local Kodiak spawning stocks. The Offshore West Afognak Section (#A050) will remain open to allow for potential harvest of Kamishak herring.

Appendix C.1. Comparison of age frequency by management unit of sac roe herring harvest for the Kodiak Management Area, 1982-1991.



* FOR FOOTNOTES SEE PAGE FOLLOWING AGE FREQUENCY GRAPHS.



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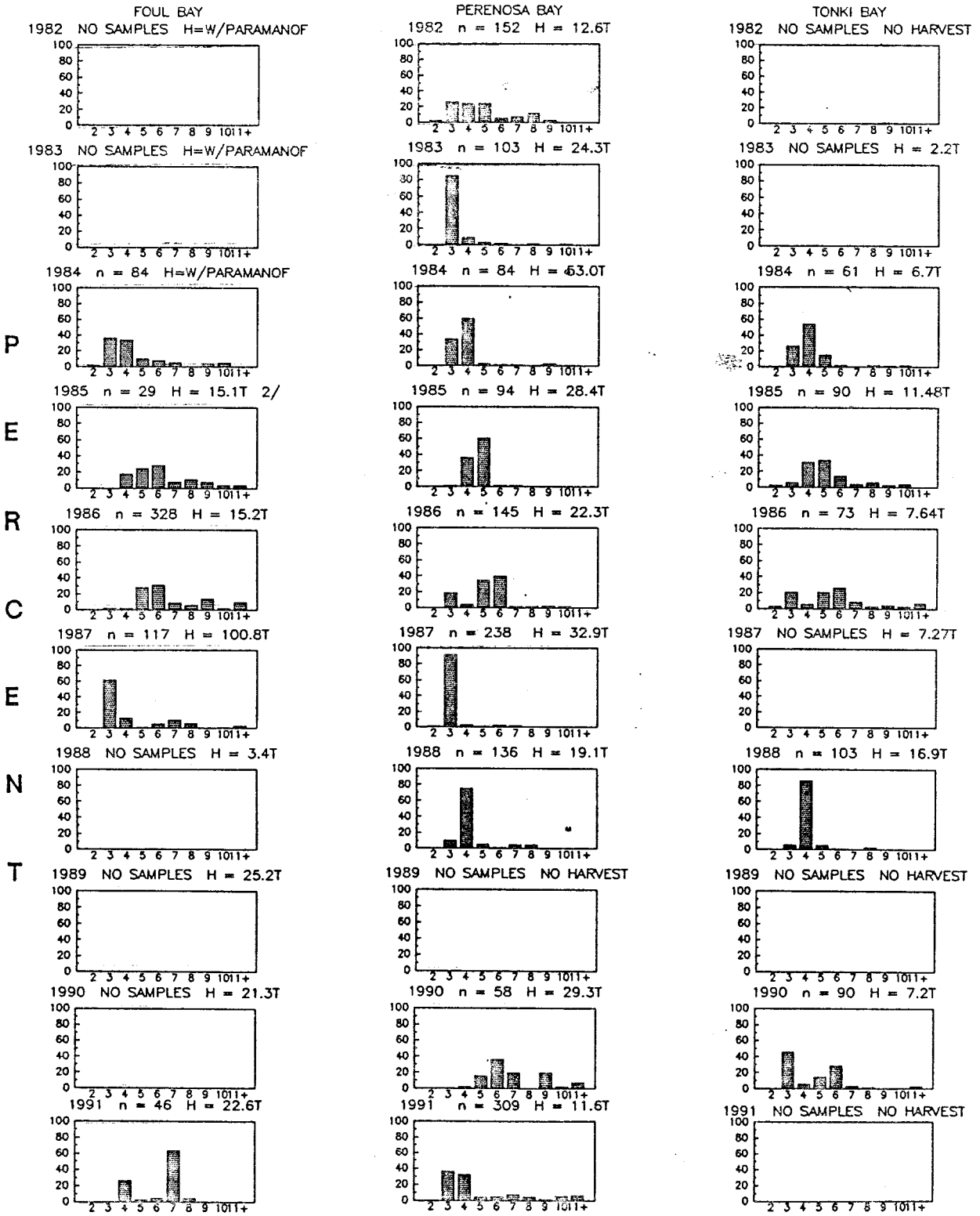

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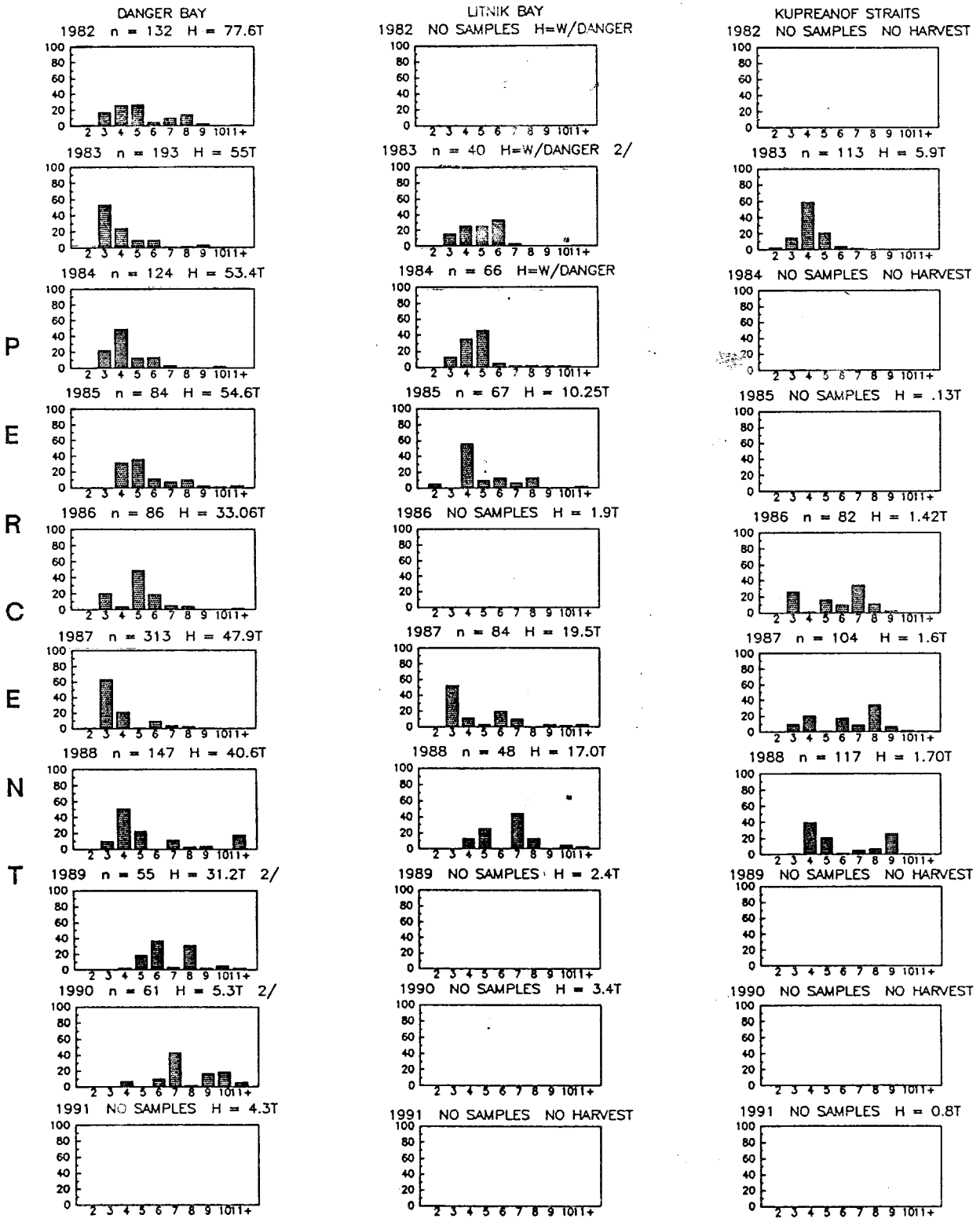

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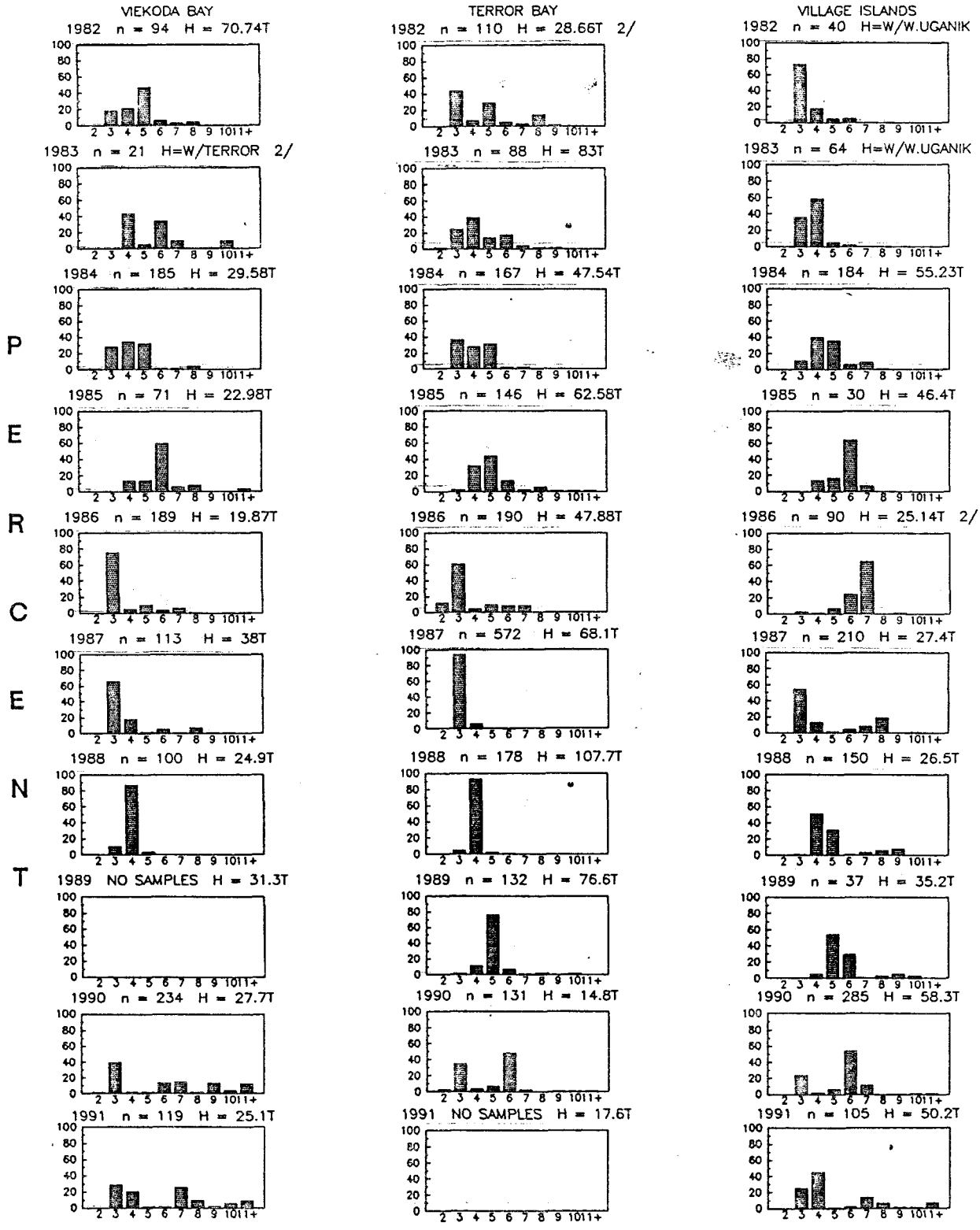

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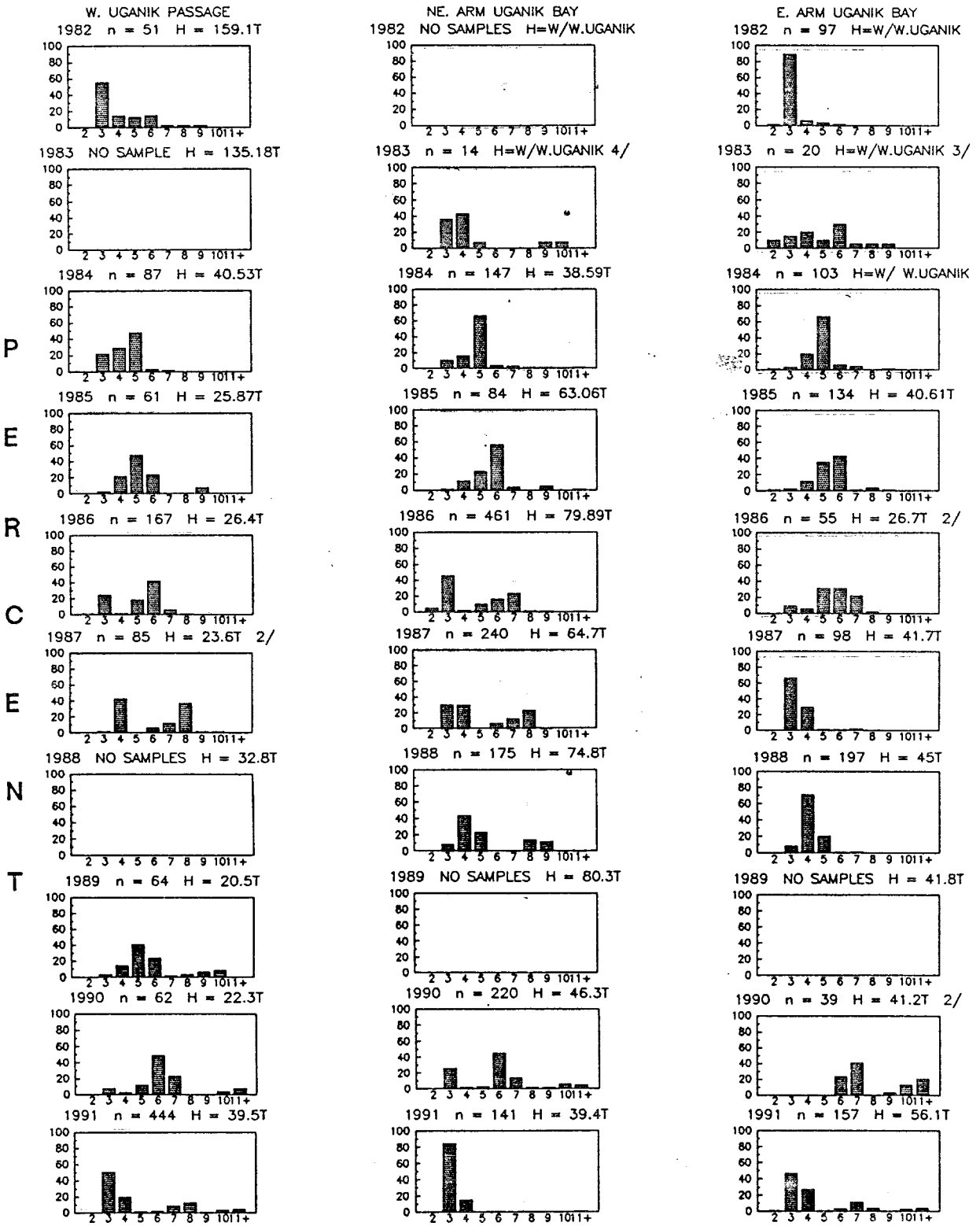

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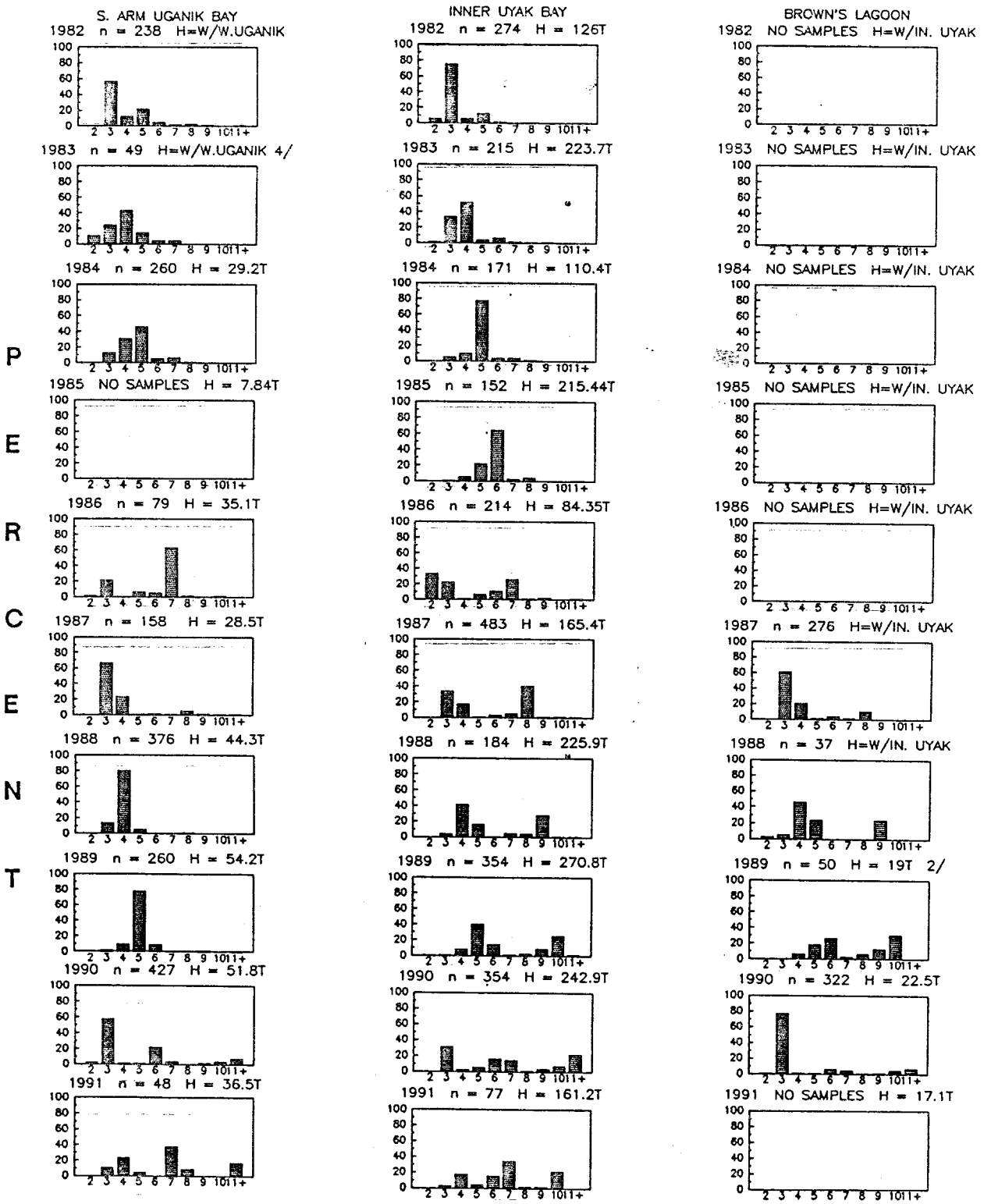

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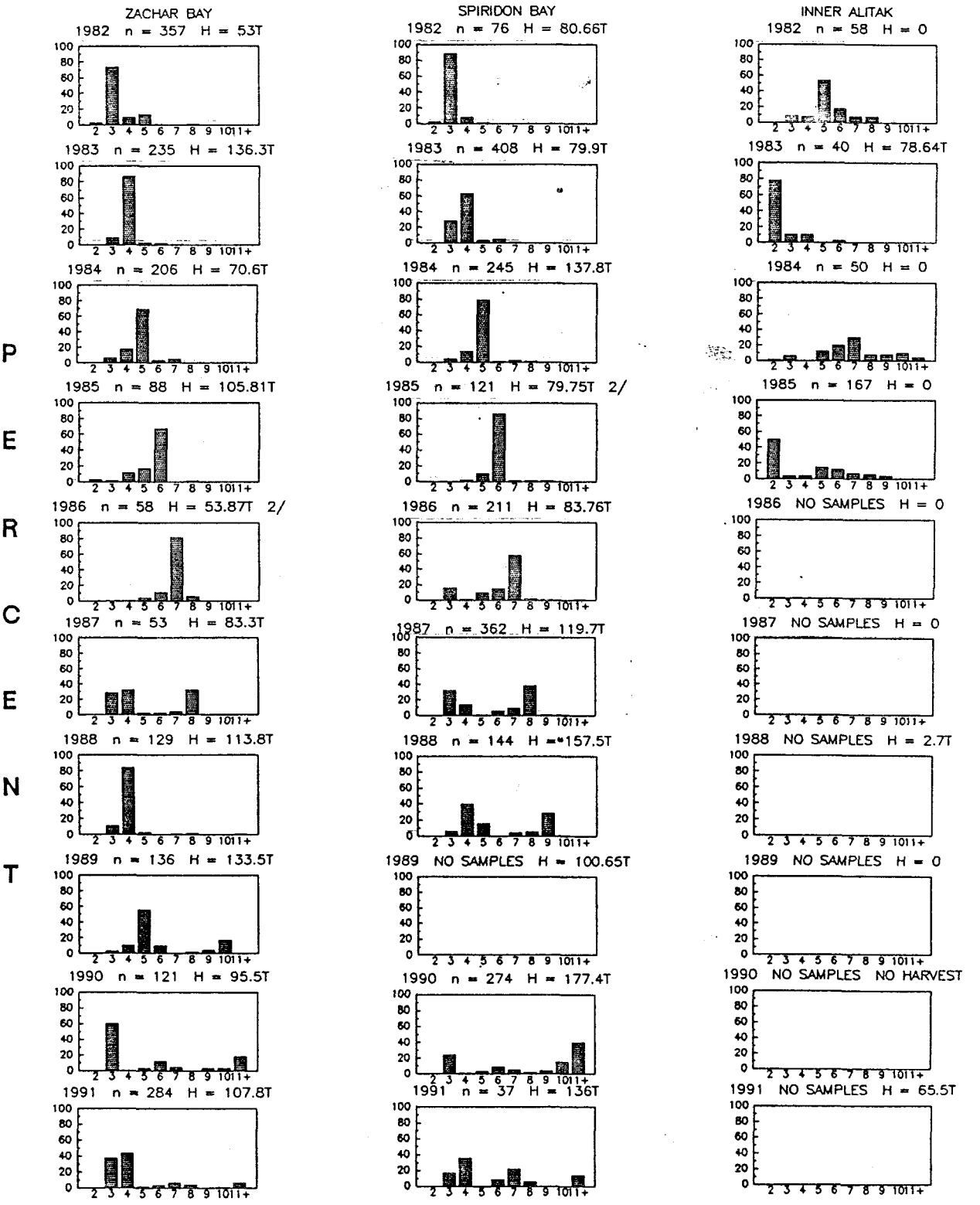

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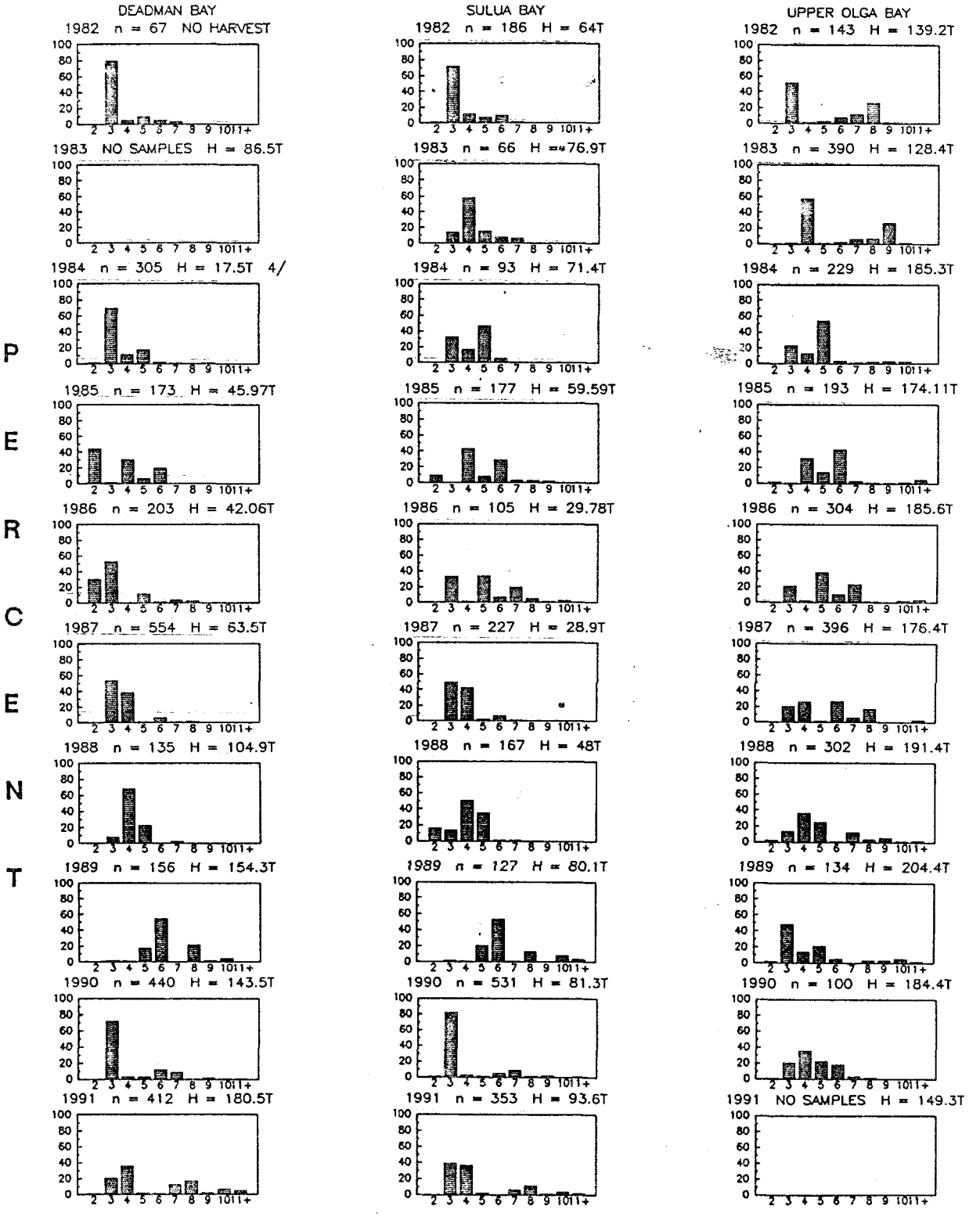

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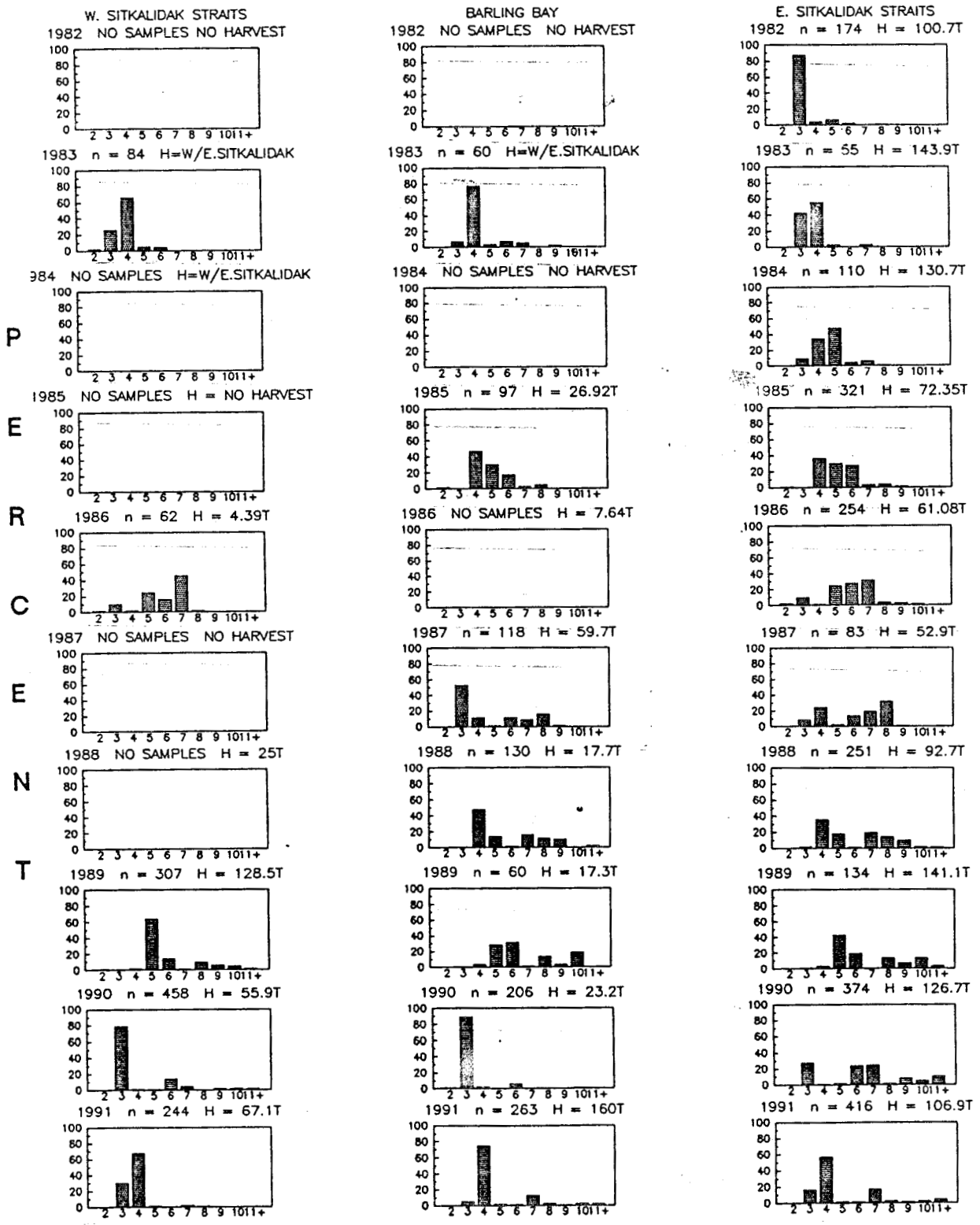

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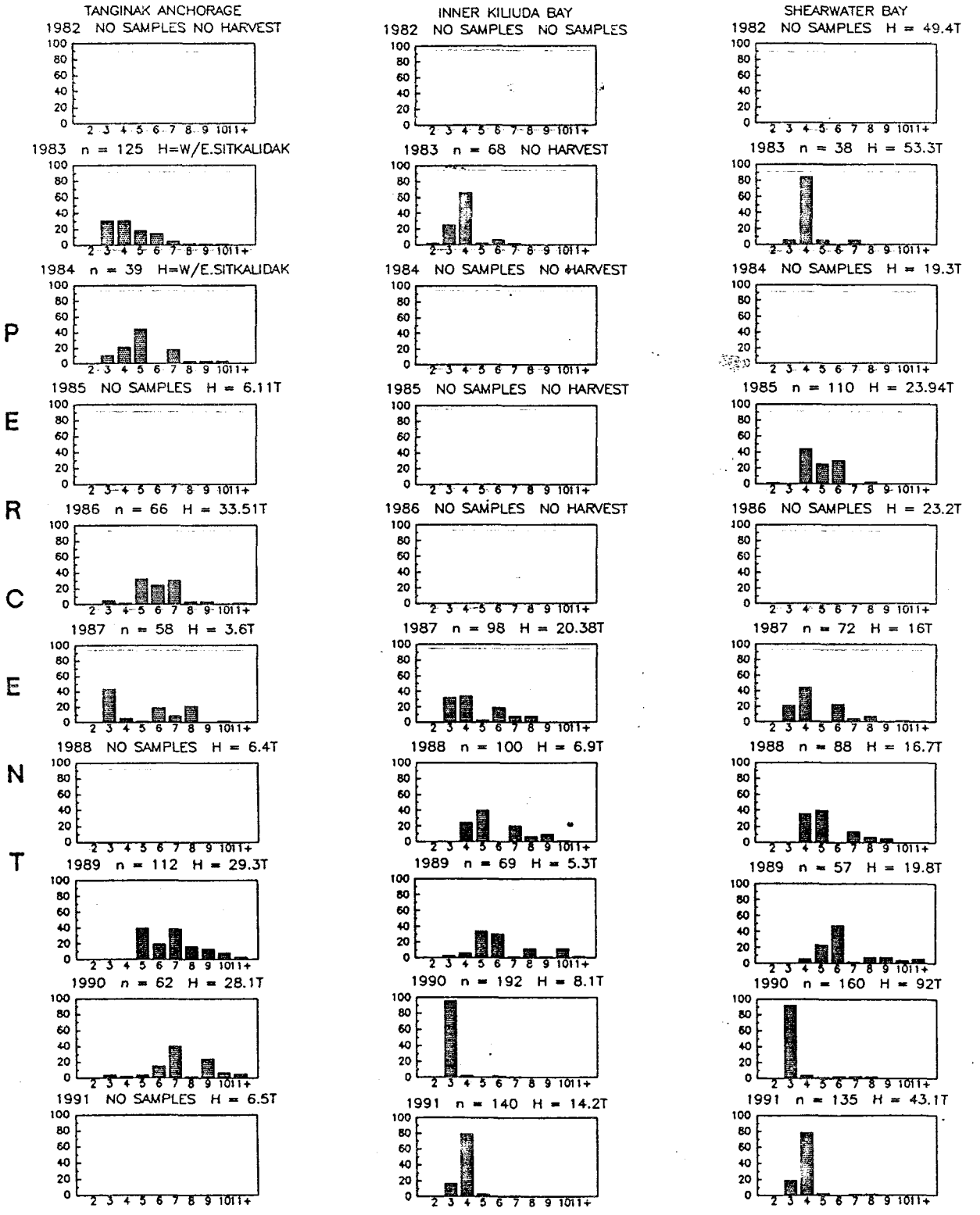

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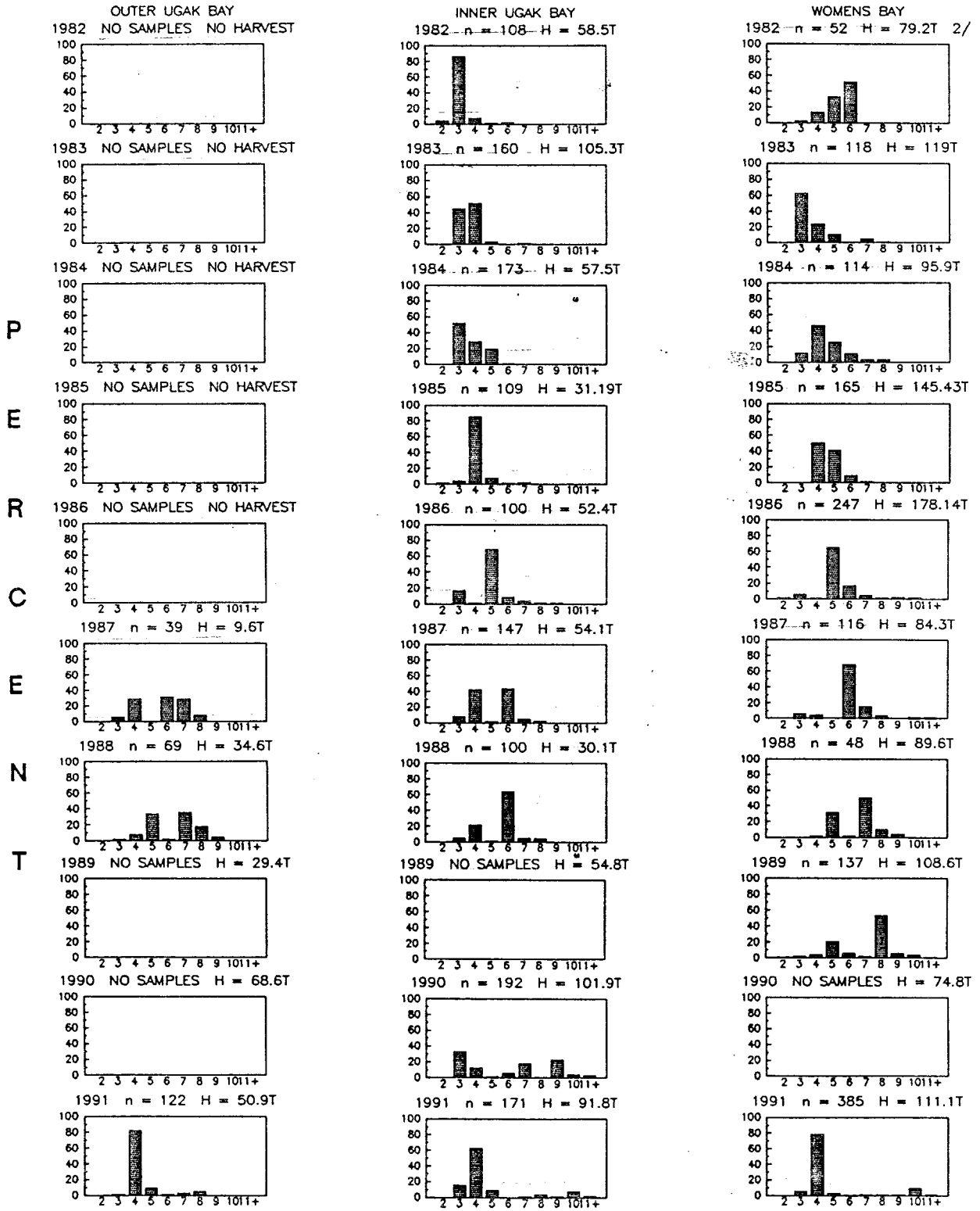

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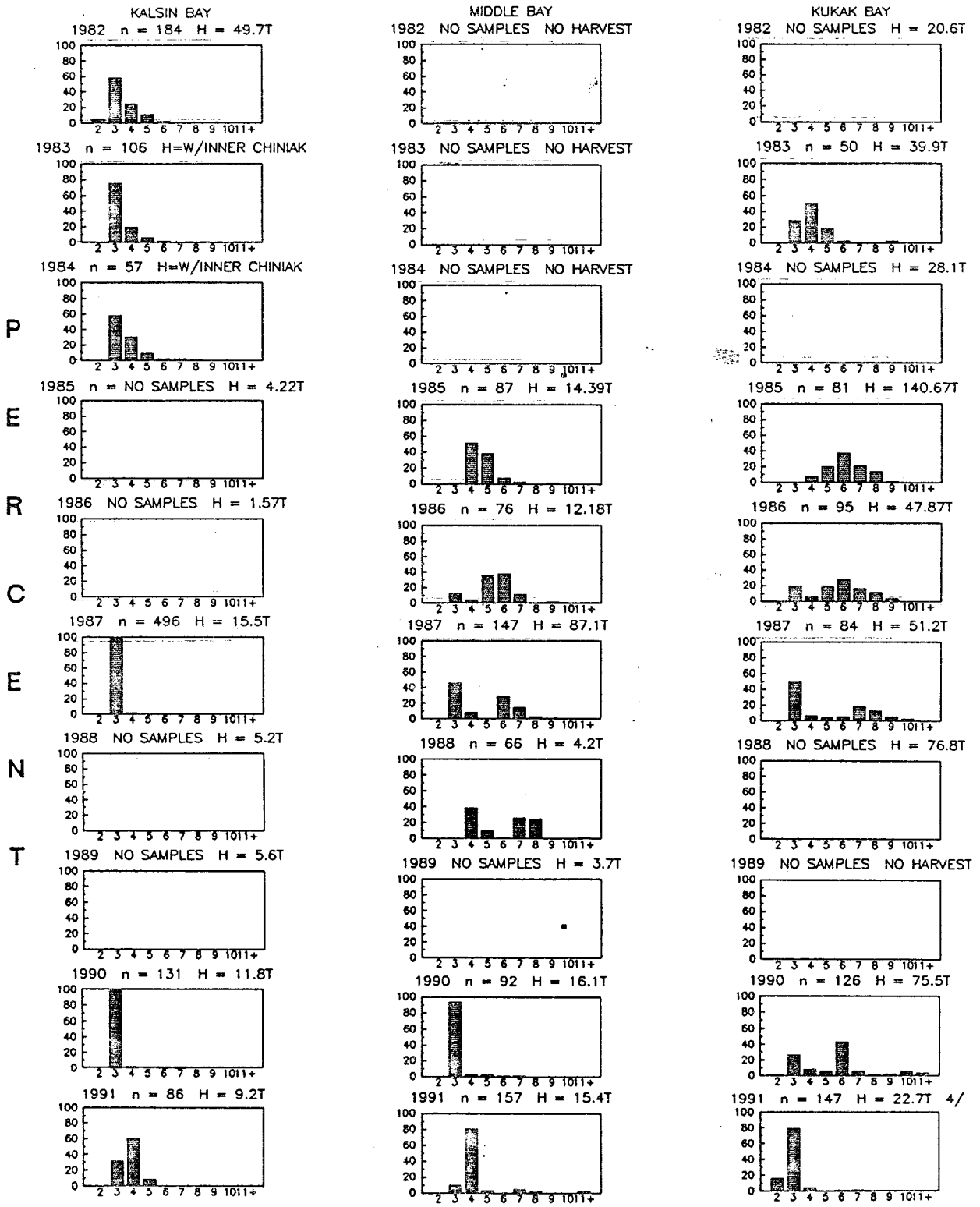

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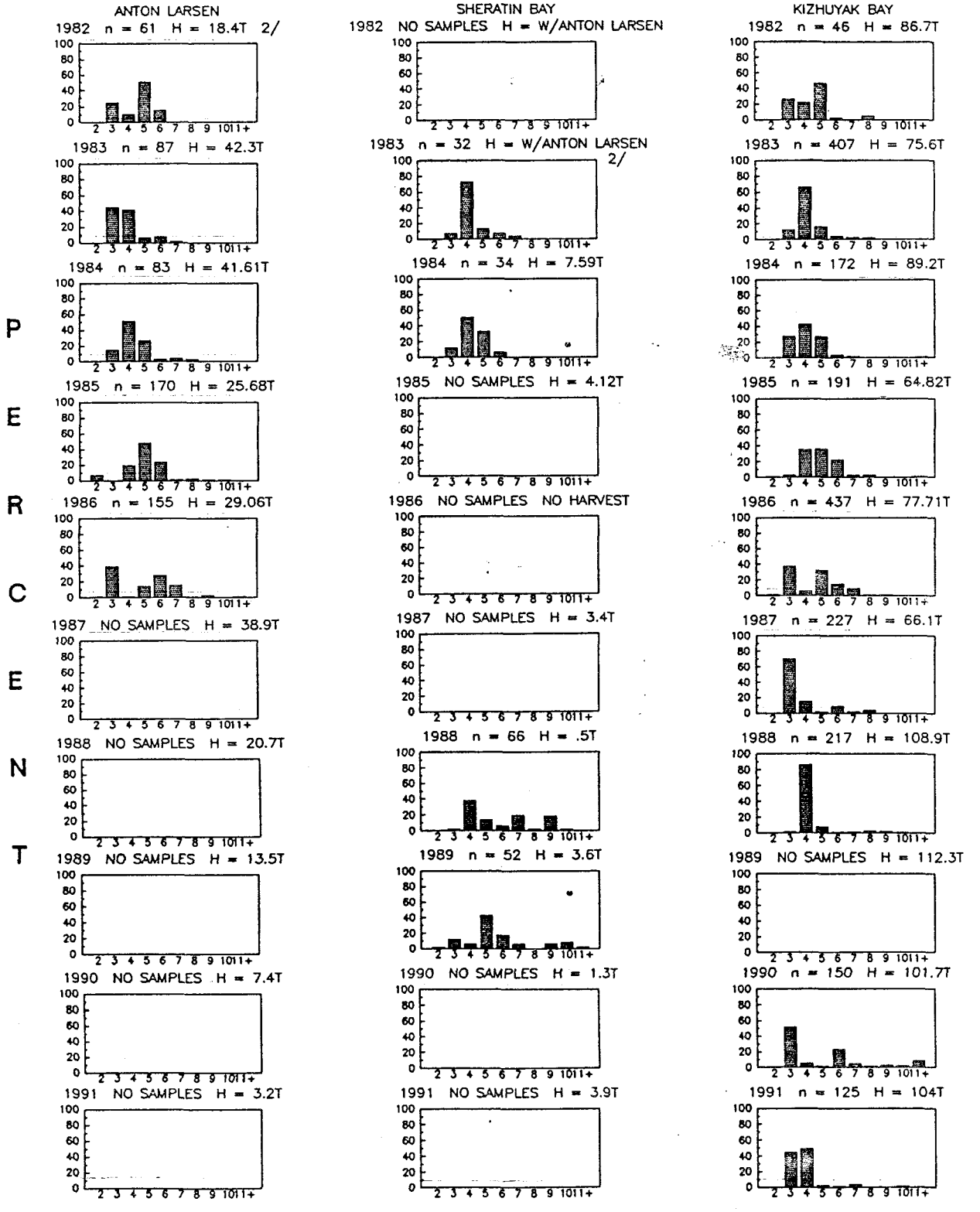

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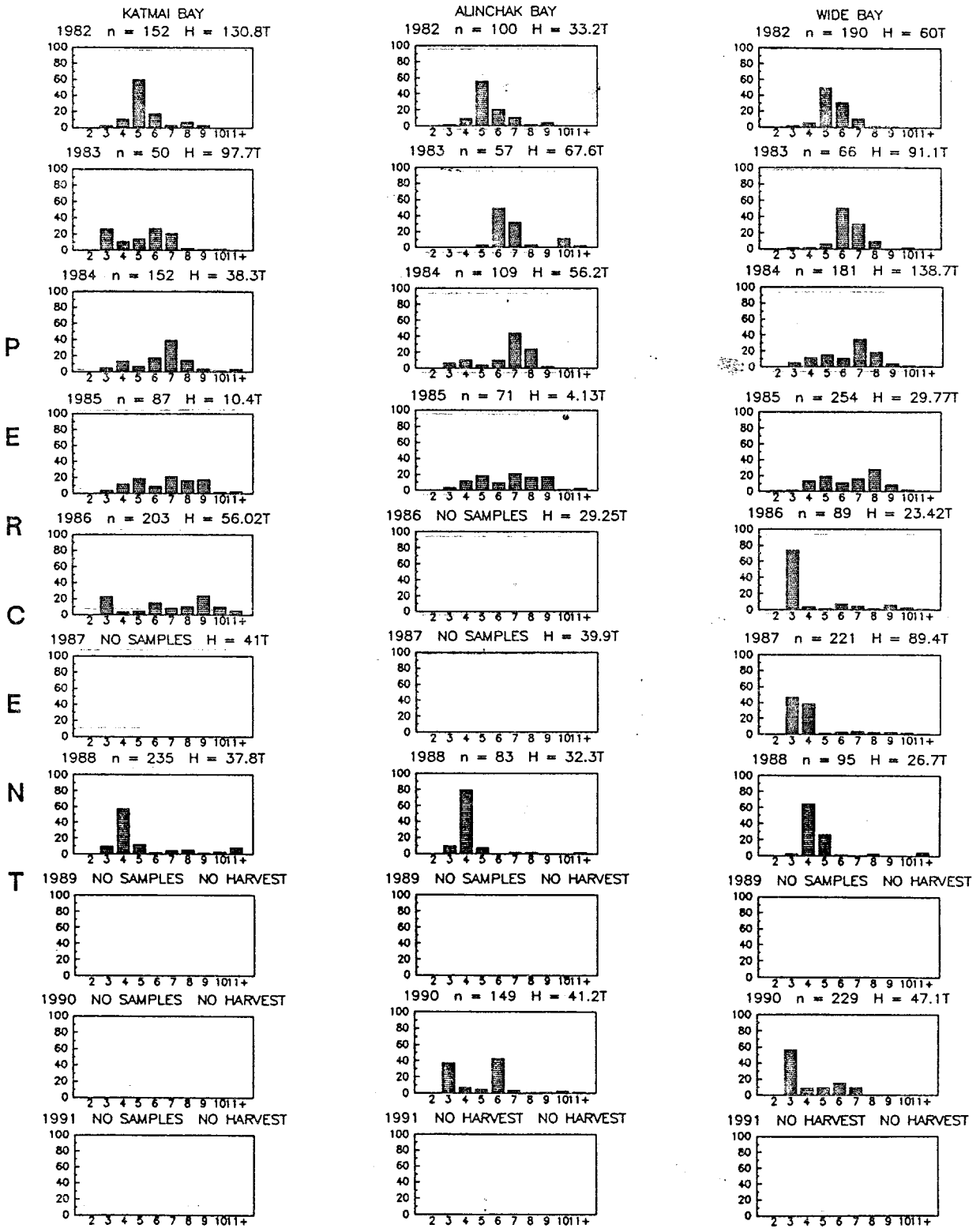

* FOR FOOTNOTES SEE PAGE FOLLOWING AGE FREQUENCY GRAPHS.

1991/92

HARVEST STRATEGY FOR THE KODIAK MANAGEMENT AREA

COMMERCIAL FOOD/BAIT HERRING FISHERY

By

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and
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Regional Information Report[1] No 4K91-19

Alaska Department of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

September 1991

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

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INTRODUCTION

- This harvest strategy attempts to answer most pertinent pre-season and in-season questions regarding the Kodiak food/bait herring fishery.

- This fishery targets both Kodiak and Kamishak spawning stocks which are present in the Kodiak Area during the food/bait season (8/1 - 2/28).

- Since the herring sac-roe fisheries in the Kodiak and Cook Inlet areas are closed-to-entry fisheries, they are treated as primary fisheries and are managed to provide for the majority of the harvest on the affected stocks to occur in these fisheries. The food/bait fisheries on these same stocks are subsequently treated as secondary fisheries and associated harvest levels are directly related to the results of the sac-roe fisheries on these stocks; food/bait harvest levels generally will not exceed 10% of the sac-roe harvest on any of these stocks. Consequently, consideration is given to the biological concerns associated with "double dipping" fisheries on the same stock and is also given to the 200+ limited entry permit holders for both Kodiak and Cook Inlet sac-roe fisheries whose economic interests in permits could be adversely affected without a specific allocative directive for each fishery.

- Since the commercial sac-roe fisheries in Kodiak and Cook Inlet target on herring with mature roe beginning with age 4 and primarily on age 5 and older herring, individual food/bait landings of age 3 or less will be adjusted to reflect weights of age 5 herring.

- A Board of Fisheries regulatory change in March 1988 resulted in the directive to manage the Kodiak Area food/bait fishery in a manner which considers the aforementioned concerns. Specifically management is guided by the following regulation:

  5 AAC 27.535

  a) The department shall manage the herring food/bait fishery, (directed on Kodiak spawning stocks) so that the food/bait harvest does not exceed 10% of the actual herring harvest in the previous season.

  b) The department shall manage the herring food/bait fishery that is directed on Kamishak spawning stocks, which over-winter in the Eastern Shelikof Strait, so that the food/bait harvest does not exceed 2% (two) of the total available spawning biomass of Kamishak stocks as determined by the department during the most recent Kamishak herring sac-roe season.

SEASON:

- August 1, 1991 through February 28, 1992.

FISHING PERIODS:

- Open to continuous fishing from 12:01 A.M. 8/1/91 to 12:00 P.M. 2/28/92 unless superceded by emergency order closures.

CLOSED WATERS:

- See CLOSED WATERS section of the 1991 Commercial Herring Fishing Regulations (page 46), 5 AAC 27.530

- Consult 1991 Commercial Salmon Fishing Regulations for listing of closed waters for the Kodiak food/bait herring fishery for the period August 1 through October 31, pages 57-61.

PERMITS REQUIRED (2):

A. Interim Use Permits for legal gear:

- H01K Purse Seine
- H34K Gillnet
- H07K Trawl

B. Registration Permit - Kodiak ADF&G Office

- Permit will be used for:
  - Monitoring fleet size by gear type.
  - Clarifying catch reporting procedures, closed water areas, and in-season emergency order announcement procedures.

- Both permits are available at the Kodiak Fish and Game Office.

LEGAL GEAR RESTRICTIONS:

01 - Purse Seines
- Maximum length: 100 fathoms
- Maximum depth: 1,00 meshes. For Area K there are no web size restictions.
- Lead length unrestricted.

34 - Gillnets
- Maximum length: 150 fathoms; mesh size: 2-1/8" - 2-1/2".

07 - Trawl
- No restrictions

- Consult the 1991 Commercial Herring Fishing Regulations for a complete listing of all regulations.

HARVEST STRATEGY:

Regulation 5 AAC 27.535(a)(b), as approved by the Alaska Board of Fisheries in March 1988, describes a harvest strategy for the Kodiak Area food/bait fishery which provides for:

- A secondary food/bait harvest, following a primary sac-roe harvest, on both Kodiak spawning stocks and on Kamishak spawning stocks which occur in the Kodiak Management Area during the Kodiak food/bait season (8/1 - 2/28).

- An exclusion of a food/bait harvest on Kodiak stocks in that portion of Shelikof Strait associated with the occurrence of Kamishak stocks as depicted in Figure 1, except that a harvest on Kodiak stocks may occur in the aforementioned units if the harvest occurs in in-shore areas (bays) prior to a closure of these areas based upon the G.H.L. for Kamishak stocks being achieved.

- An exploratory harvest scenario on unidentified stocks which occur in areas not covered by the two aforementioned provisions.

To accommodate this harvest strategy, thirteen (13) food/bait management units have been established to include geographical groupings of sac-roe stocks and adjacent offshore areas.

- For each management unit there is a Guideline Harvest Level (G.H.L.) which reflects the combined G.H.L.'s for Kodiak stocks included within each food/bait unit (See Table 1).

- Six of these food/bait units have also been identified and consolidated into a geographical grouping representing that area where the food/bait harvest on Kamishak stocks will most likely occur (See Figure 1).

The 1991-1992 food/bait G.H.L. for the Kodiak Area will be affected by the following management considerations:

- <u>For Kodiak spawning stocks</u>, the department will generally limit the food/bait harvest to 10% of the previous spring's sac-roe harvest on a stock by stock basis (Table 1). Variations are exlained in the footnotes in Table 1. Harvest levels on Kodiak stocks in the adjacent offshore areas will reflect the combined food/bait G.H.L. for the sac-roe stocks included within that management unit.

- <u>For Identified non-Kodiak spawning stocks</u>, the department will control the harvest to insure that a particular stock is not overexploited. Currently, Kamishak Bay spawning stock(s) is the only identified non-Kodiak spawning stock(s) which occurs in the Kodiak Management Area during the Kodiak food/bait season (8/1 - 2/28).

  - In the case of Kamishak Bay spawning stock(s) where evidence exists that it is present in Kodiak area waters during the food/bait season, the harvest level will not be allowed to exceed 212 tons. This tonnage is approximately 1% of the 1991 Kamishak Bay pre-sac-roe season total available indexed spawning biomass of 21,254 short tons.

- Management of Kamishak stocks for both the sac-roe and food/bait fisheries is outlined in Appendix A.

- During the food/bait fishery, the Department will attempt to identify the location of Kamishak stock(s) in Kodiak Area waters via data collected from the commercial fishery and/or the ADF&G vessel M/V Resolution during its hydroacoustical surveys targeting on Shelikof Strait herring biomass; the M/V Coho may also assist in this search.

  - All herring samples will be expeditiously worked-up to apply AWL comparisons between Kodiak and Kamishak stocks.

  - Biomass estimates will be obtained from the fishery in terms of verbal estimation via skipper interviews as to stocks, distribution, average school size and estimated number of schools. Biomass estimates will also be obtained acoustically from the M/V Resolution surveys.

- Herring harvested in this fishery from the following management units will be identified as either Kodiak stocks (per regulation 5 AAC 535(2) or as Kamishak stock(s).

- These units include F/B 1, F/B 2, F/B 4, F/B 5, F/B 11 and F/B 12 as as depicted in Figure 1.

- Herring harvested from the aforementioned food/bait management units, where the harvest occurred in in-shore (bays) locations, will be considered to be Kodiak stocks unless A-W-L and/or biomass data indicates otherwise, in which case they will be considered to be Kamishak stocks.

  - If the harvest ceiling of 212 tons on Kamishak stocks is achieved, all of the aforementioned management units would be closed to herring fishing for the remainder of the food/bait season.

- <u>For non identified herring stocks</u> which may occur in off-shore locations in the remaining food and bait management units, the department will control the harvest to insure that a particular stock is not overexploited. Actual harvest levels may be determined by harvest location, biomass observed and age-weight-length information.

<u>GUIDELINE HARVEST LEVELS</u>:

- For the 1991/92 food/bait season the following harvest levels will be in effect:

  - <u>For Kodiak spawning stock:</u> Per regulation 5 AAC 27.535(a) as described under "Harvest Strategy", a maximum of 337.9 tons properly distributed by stock throughout the management area will be the food/bait harvest on Kodiak spawning stocks.
    - See Table 1 for harvest projections by stock.

  - <u>For Kamishak spawning stock:</u> Per regulation 5 AAC 27.535(b) as described under "Harvest Strategy", a maximum of 212 tons harvested from that portion of Shelikof Strait depicted in Figure 1 (see attached) will be the food/bait harvest ceiling on Kamishak spawning stocks which occur in the Kodiak Area during the food/bait season (8/1 - 2/28).

- Prior to harvesting Kamishak stocks in the aforementioned area, a harvest on Kodiak stocks may occur per regulation 5 AAC 27.535(a).

    - Herring harvested in inshore (bays) locations will be considered to be Kodiak stocks unless A-W-L sampling and/or biomass information indicates otherwise, in which case they will be considered to be Kamishak stocks.

- For unidentified stocks: No guideline harvest levels are established, however the department shall manage food/bait harvests in these areas not to exceed 10% exploitation rate.

    - Harvest levels per geographically distinct biomasses will be established in-season per information obtained from A-W-L sampling and from "skipper" interviews detailing estimates of biomass seasonal distribution and school size.

REPORTS REQUIRED BY FISHERMEN:

- All landings of herring for food/bait purposes must be verbally reported to ADF&G before the product is totally unloaded at the dock.

    - The following phone numbers will reach Fish and Game personnel 24 hours per day:

        - ADF&G Office: Monday through Friday
          8:00 A.M. to 4:30 P.M. - 486-4791

        - After Office Hours:
          4:30 P.M. to 8:00 A.M. - 486-6007 (Dave Prokopowich)
          - 486-6475 (Kevin Brennan)
          - 486-4831 (Pete Probasco)

All fish tickets must be completed and sent in to the Kodiak Fish and Game office within a week of the landing.

- Send to: Alaska Department of Fish and Game
  Division of Commercial Fisheries
  ATTN: Dave Prokopowich
  211 Mission Road
  Kodiak, Alaska 99615

Table 1. Kodiak Management Area 1991/92 Herring Food/Bait Harvest Strategy
A Listing of Guideline Harvest Levels by Food/Bait Management Units[1/]
(G.H.L. harvest numbers represent short tons) Page 1 of 3

Food/Bait Mgmt. Units	Sac-Roe Management Units No.	Name	1991 Sac-Roe G.H.L.	Harvest	1991/92 Food/Bait G.H.L.
F/B 1	AO10	Raspberry	110.0	116.6	11.7
	AO20	Malina	30.0	57.6	5.8
West Afognak	AO31	Paramanof	40.0	204.5	20.5[3/]
Unit	AO32	Foul Bay	20.0	22.6	2.3
	AO40	Blue Fox	10.0	0.0	1.0
	AO50	Offshore Afognak	-	0.0	[5/]
UNIT TOTALS:			210.0	401.3	41.3
F/B 2	AO60	Shuyak	20.0	0.0	2.0[4/]
	AO70	Perenosa	15.0	11.6	1.5
North Afognak	AO71	Delphin	10.0	1.1	1.0
Unit	AO72	Seal Bay	10.0	0.0	1.0
	AO80	Tonki	15.0	0.0	1.5
UNIT TOTALS:			70.0	12.7	7.0
F/B 3	AO90	Izhut	25.0	6.5	2.5
	AO91	Kitoi	15.0	1.0	1.5
East Afognak	AO92	McDonalds	10.0	0.0	1.0
Unit	A100	Danger	20.0	4.3	2.0
	A101	Litnik	10.0	0.0	1.0
	A102	Inshore Marmot	10.0	0.0	10.0[4/]
UNIT TOTALS:			90.0	11.8	18.0
F/B 4	UG10	Kupreanof	10.0	0.8	10.0[4/]
	UG20	Viekoda	20.0	25.1	2.5
Uganik	UG21	Terror	60.0	17.6	6.0
Unit	UG30	Village Islands	35.0	50.2	5.0
	UG31	W. Uganik Passage	20.0	39.5	3.9
	UG32	N.E. Arm Uganik	75.0	39.4	7.5
	UG33	E. Arm Uganik	40.0	56.1	5.6
	UG34	S. Arm Uganik	40.0	36.5	4.0
	UG40	Offshore Uganik	-	0.0	[5/]
UNIT TOTALS:			300.0	265.2	44.5

-continued-

Table 1. (Page 2 of 3)

Food/Bait Mgmt. Units	Sac-Roe Management Units No.	Name	1991 Sac-Roe G.H.L.	Harvest	1991/92 Food/Bait G.H.L.
F/B 5	UY10	Offshore Uyak	-	0.0	[8/]
	UY20	Harvester	10.0	0.0	1.0
Uyak	UY30	Inner Uyak	240.0	161.2	24.0
Unit	UY32	Browns Lagoon	20.0	17.1	2.0
	UY31	Larsen Bay	10.0	8.1	1.0
	UY40	Zachar	100.0	107.8	10.8
	UY50	Spiridon	160.0	136.0	16.0[4/]
UNIT TOTALS:			540.0	430.2	54.8
F/B 6 Sturgeon/ Halibut Unit	SH01	Sturgeon/Halibut	Exploration	0.0	Exploration
UNIT TOTALS:				0.0	-
F/B 7	AL10	Outer Alitak	-	0.0	
	AL20	Inner Alitak	Exploration	65.5	Exploration
Alitak	AL21	Deadman	155.0	180.5	18.0
Unit	AL30	Sulua	75.0	93.6	9.4
	AL40	Lower Olga/Moser	15.0	12.0	1.5
	AL50	Upper Olga/Moser	190.0	149.3	19.0[4/]
	AL60	Geese/Twoheaded	Exploration	0.0	Exploration
UNIT TOTALS:			435.0	500.9	47.9
F/B 8	GO10	Kaiugnak	10.0	0.0	1.0
	GO20	W. Sitkalidak	65.0	67.1	6.7
Eastside	GO21	Barling	20.0	160.0	16.0[3/]
Unit	GO22	E. Sitkinak	95.0	106.9	10.7
	GO23	Tanginak	15.0	6.5	1.5
	GO30	Outer Sitkalidak	Exploration	0.0	-
	GO40	Outer Kiliuda	Exploration	0.0	Exploration
	GO41	Inner Kiliuda	10.0	14.2	1.4
	GO42	Shearwater	25.0	43.1	4.3
	GO50	Outer Ugak	Exploration	50.9	Exploration
	GO50	Pasagshak	25.0	0.0	2.5
	GO51	Inner Ugak	50.0	91.8	9.2[3/]
UNIT TOTALS:			315.0	540.5	53.3

-continued-

Table 1. (Page 3 of 3)

Food/Bait Mgmt. Units	Sac-Roe Management Units No.	Name	1991 Sac-Roe G.H.L.	Harvest	1991/92 Food/Bait G.H.L.
F/B 9	GO60	Womens Bay	110.0	111.1	11.1
	G100	Kalsin Bay	15.0	9.2	1.5
Chiniak	G101	Middle Bay	20.0	15.4	2.0
Unit	G102	Inshore Chiniak	10.0	0.0	10.0[4/]
UNIT TOTALS:			155.0	135.7	24.6
F/B 10	GO70	Monashka/Mill Bay	Exploration	0.0	Exploration
	GO80	Anton Larsen	15.0	3.2	1.5
North Kodiak	GO81	Sheratin	10.0	3.9	1.0
Unit	GO90	Kizhuyak	110.0	104.0	11.0
	G103	Spruce Island	10.0	0.0	10.0[4/]
UNIT TOTALS:			145.0	111.1	23.5
F/B 11	MO10	North Mainland	Exploration	0.0	Exploration
	MO20	Inner Kukak	50.0	22.7	5.0
North Mainland	MO30	Outer Kukak	-	0.0	Exploration
Unit	MO40	Missak	Exploration	0.0	Exploration
UNIT TOTALS:			50.0	22.7	5.0
F/B 12	MO50	Inner Katmai	50.0	0.0	5.0
	MO60	Outer Katmai	-	0.0	Exploration
Mid-Mainland	MO70	Alinchak	30.0	0.0	3.0
Unit	MO80	Puale Bay	Exploration	0.0	Exploration
	MO90	Portage Bay	Exploration	0.0	Exploration
UNIT TOTALS:			80.0	0.0	8.0
F/B 13	M100	Outer Portage	-	0.0	Exploration
South Mainland	M110	Wide Bay	100.0	0.0	10.0
Unit	M120	Lower Shelikof	-	0.0	Exploration
UNIT TOTALS:			100.0	0.0	10.0
GRAND TOTALS:			2,490.0	2,432.0	337.9

*See footnotes on next page.

FOOTNOTES:

[1/]The Kodiak Area total G.H.L. for food/bait fishery, as indicated in the 1991 Herring Regulations, is managed so that the food/bait harvest does not exceed 10% of the actual herring sac-roe harvest in the previous season. This table reflects the available food/bait harvest for each sac-roe stock or food/bait unit, whichever applies. (See Harvest Strategy.)

[2/]Sac-roe management units where excessive sac-roe harvests may have occurred either this year or in the past and where a reduced food/bait harvest is justified.

[3/]Sac-roe management units where the sac-roe harvest substantially exceeded pre-season expectations probably as a result of increased stock abundance rather than overharvest and where an increased food/bait harvest commensurate with the increased sac-roe fishery is justified.

[4/]Sac-roe management units where a sac-roe underharvest may have occurred and where an increased food/bait harvest is justified. In some cases where the stock status is in question the increased food/bait harvest may still be less than pre-season expectations on those stocks.

[5/]Sac-roe management units where the sac-roe harvest was substantially less than pre-season expectations probably as a result of an overestimation of stock strength and where a reduced food/bait harvest is justified.

[6/]See plan for management of the Kamishak Bay Herring Spawning Stocks in the Eastern Shelikof Strait Food and Bait Fishery (Page 9).

Appedix A. Management of the Kamishak Bay Herring Spawning Stocks in the Shelikof Strait Food and Bait Fishery.

Addendum to the 1988 Kamishak Bay Herring Management Plan

Kamishak Bay herring spawning stocks support both the Kamishak Bay sac-roe fishery and the Shelikof Strait food and bait fishery. Pursuant to the Board of Fisheries decision to allocate 2% of the Kamishak Bay herring spawning biomass to the Shelikof Strait food and bait fishery, the following adjustments will be made to the 1988 Kamishak Bay sac-roe fishery management plan to accommodate the Board's actions and to protect the Kamishak Bay herring stock from over harvest:

1) ADF&G guidelines direct that herring harvest rates be kept at or below 20% of the current best estimate of biomass, depending upon stock strength and age composition. Best estimates of biomass of the Kamishak Bay herring stock are currently determined by aerial survey following the spring sac-roe fishery. Therefore, harvest levels in the Shelikof Strait food and bait fishery will be based on this estimate of spawning biomass.

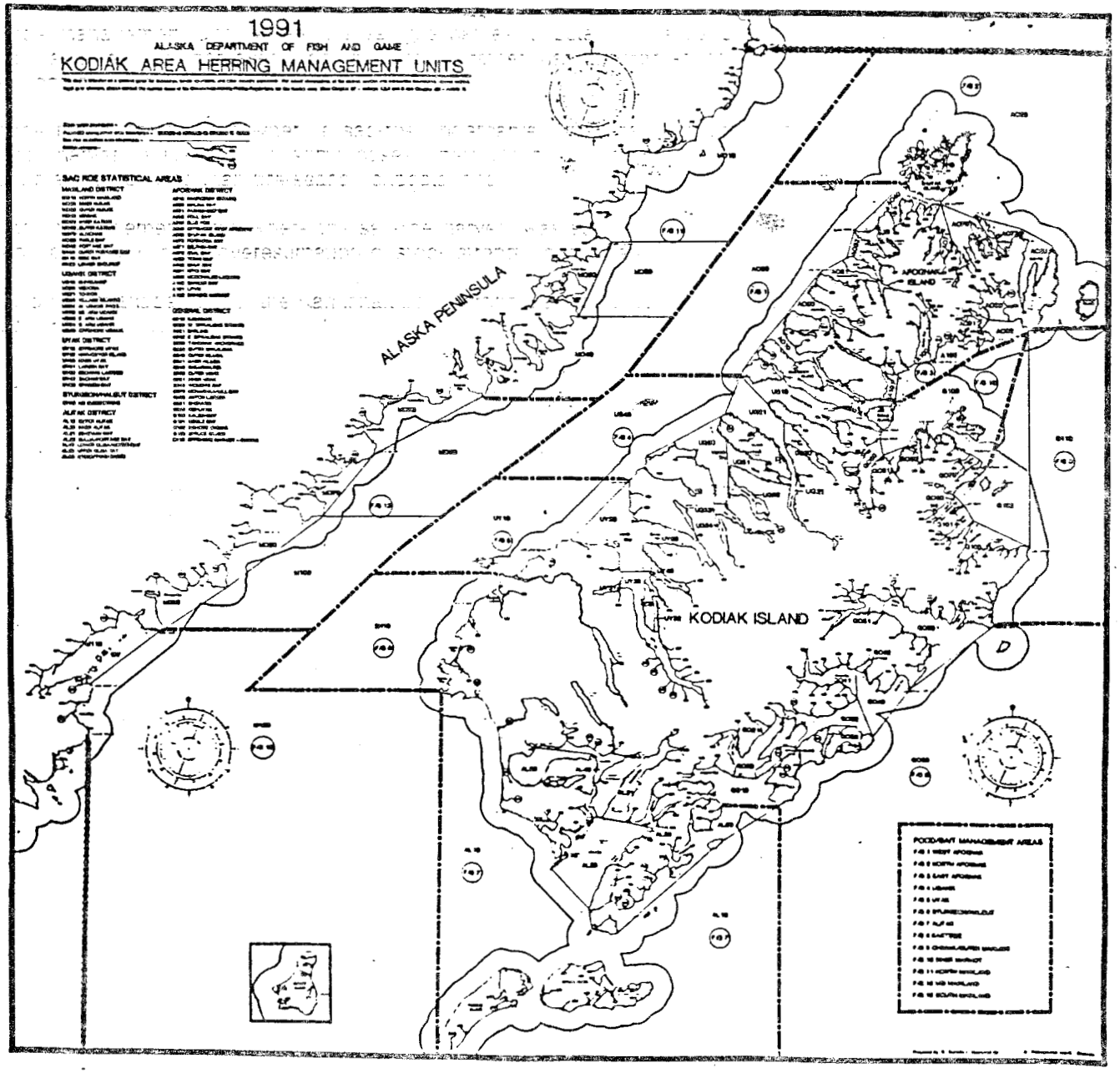
2) The harvest ceiling for the Shelikof Strait food and bait fishery will be 2% of the best estimate of the total Kamishak biomass, as determined by the Department during the most recent Kamishak herring sac-roe season. The total Kamishak Bay biomass will be determined by the best estimate of the spawning biomass following the sac-roe fishery plus the total harvest from the sac-roe fishery.

3) Present management strategy for the Kamishak Bay spawning stock attempts to achieve a maximum harvest rate on older fish of 20% while keeping the harvest rate of fish age 5 and younger at or below 10%.

4) If ADF&G determines the harvest rate for the stock of Kamishak Bay herring should be less than 20%, either due to a decrease in biomass, weak year classes, or poor recruitment, the 2% food and bait harvest ceiling will be reduced proportionally. [i.e. If the biological markers (decrease in biomass, weak year classes, or poor recruitment) indicate that the sac-roe harvest needs to be reduced, for example to 15%, the food and bait fishery would be reduced to 1.5%]

5) If the spawning biomass of the Kamishak Bay herring stock falls below the biological threshold level of 8,000 tons, both the Kamishak Bay sac-roe and the Shelikof Strait food and bait fishery will be closed or severely limited.

6) The allocation of herring to the Shelikof Strait food and bait fishery is based on spawning biomass, primarily age 5 and older herring, not on the biomass of juveniles. Therefore, the quantity of Kamishak Bay stocks ages 4 and younger caught in Shelikof Strait will be adjusted upward to bring the biomass of these younger age classes up to the biomass of age 5 herring.


1991
ALASKA DEPARTMENT OF FISH AND GAME
KODIAK AREA HERRING MANAGEMENT UNITS
SAC ROE STATISTICAL AREAS
ALASKA PENINSULA
KODIAK ISLAND
APOGNAK ISLAND

Appendix E.1. (page 1 of 2)

HERRING SUBSISTENCE/PERSONAL USE PERMIT

FOR

THE KODIAK MANAGEMENT AREA

For Year:_____ Permit No._____

HARVEST LOG

HARVEST DATE	HARVEST POUNDAGE	HARVEST LOCATION	TYPE OF USE		
			FOOD	BAIT	OTHER

This form must be returned to the ADF&G office by October 1, 1992

Alaska Department of Fish & Game
211 Mission Road
Kodiak, Alaska 99615

Attn: Dave Prokopowich

Phone: 486-4791

Permittee Name:_____

Address:_____

_____

Signature:_____
(Permittee)

Issued by:_____

Title: _____

Date: _____

CONDITIONS OF THIS PERMIT ARE LISTED ON THE REVERSE SIDE OF THIS FORM.

CONDITIONS OF THIS PERMIT

1. This permit provides for the taking of herring for subsistence/personal use purposes during the commercial herring sac-roe fishery. Herring caught under the conditions of this permit are for personal use only and may not be sold.

2. This permit is valid only for persons not participating in the commercial sac-roe fishery as a permit holder or crewman.

3. Commercial sac-roe fishermen participating in the Kodiak sac-roe fishery as a permit holder or crewman may retain herring from their lawfully taken commercial catch to fulfill their personal bait or food requirements.

4. For the purposes of this permit participating in the commercial sac-roe fishery means: being a permit holder or crewman who is operating commercial herring gear or on a vessel which has commercial herring gear on board.

WHEN: This permit is only required from April 15 through June 30; no permit is required to take subsistence/personal use herring during the remainder of the year, from July 1 through April 14. During the sac-roe season there are no closed periods to subsistence/personal use fishing.

WHERE: This permit is valid for all waters of the Kodiak Management Area, including those closed to commercial herring fishing. However, at any time, if biological or unlawful circumstances warrant it, emergency order closures of pertinent areas may be required.

HOW: This permit limits the type and quantity of gear to gillnet gear not exceeding **25 fathoms** in length. The net must be attended at all times while fishing and be marked with buoys which have your name and address on them.

HOW MUCH: There are no restrictions on the amount of herring which can be taken with this permit.

REPORTING REQUIREMENTS: A complete record of harvest activity must be kept on the reverse side of this permit, to include harvest estimate in pounds of fish and the harvest location as well as type of use.

MISCELLANEOUS: No herring caught under the conditions of a herring subsistence/personal use permit may be onboard a vessel which also has commercially caught herring on board.